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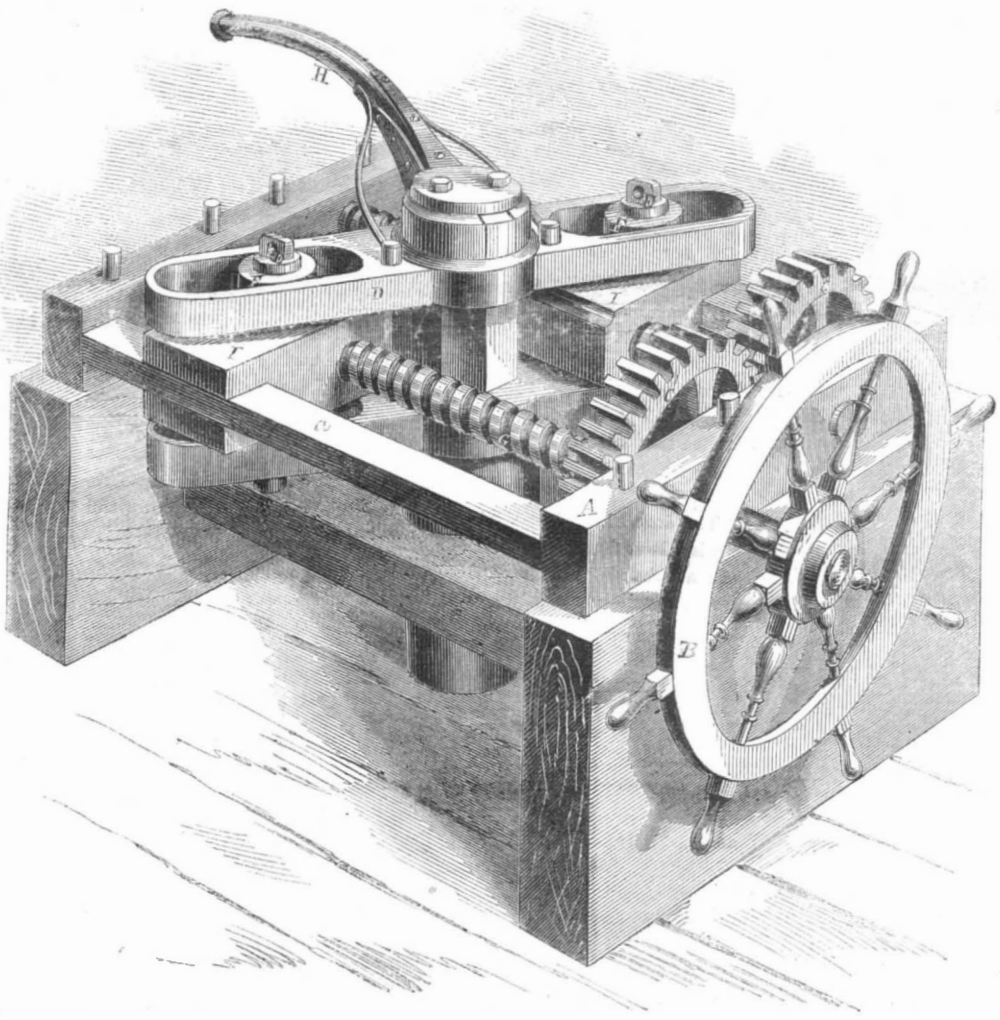
## WILCOXSON'S STEERING APPARATUS.

When the waves beat against the ship as she heaves to and fro on the restless billows, it is difficult to make her hold her course, for the rudder is knocked hither and thither, and to keep it steady it requires two or more seamen at the wheel, who have to hold on with all their might during the whole time they are on duty.

To facilitate the steering, therefore, and to hold the rudder in the position in which it is placed, D. J. Wilcoxson, of Milan, Erie county, Ohio, has invented the subject of our illustration, and patented it Sept. 20, 1858. The whole is placed in a frame, A, which is placed upon the deck in close proximity to the rudder-head; in the frame, A, two screws, G, are placed, carrying on their ends the cog-wheels, C and C', to the shaft of C, and its screw, G, outside the frame, is secured the wheel, B, by which the screws are turned and the rudder is operated; the screws, although their threads run in the same direction, have opposite motions by being moved by the cog-wheel C' from the wheel C. Two nuts, I, slide on the ways, a, and the screws, G, pass through them, so that as the screws are rotated the blocks are moved forward or back; that is to say, as one is moving forward the other is moving at a corresponding rate to a corresponding distance back. Between the screws comes up the rudder-head, to which is attached two double arms, D, the one below the screws, the other above them; the arms, D, are slotted, and a pin, E, passes through the slots and through the blocks, I, carrying on it friction-wheels, F, which move in the slots.

From this description it will be seen that from the wheel very great power can be exerted on the rudder, and that without much being expended on the wheel, as every possible care is taken to avoid friction, and to render the device easy-working in all its parts. If the rudder is not operated from the wheel it cannot be moved; the winds may blow and the billows roar, but if the rudder is strong enough, a ship can be made to hold her own through the most tempestuous seas.

By withdrawing the pins, E, and friction-rollers, F, a tiller, H, can be added, and the ship steered by the common method. As the rudder is moved from above and below the screws, and the pulling and pushing pressures are always equal, there is no likelihood of any part binding or wearing out prematurely. For large ships or steamboats, which perform voyages on rough seas or oceans, this will be a great boon. Nautical men and others interested in the invention can obtain further particulars either by addressing the inventor, or his brother, J. R. Wilcoxson, No. 175 First-avenue, New York.




**WILCOXSON'S STEERING APPARATUS.**

## NATIVE WINES.

A correspondent of the *Valley Farmer* says: — It has long been a mooted question whether the people of this country can make their own wine. I am satisfied that almost every farmer, as well as a great many persons who are not farmers, can make a plentiful supply of good wine for their own use this coming summer, at a trifling expense, if they will make an effort to do so, from the common blackberry.

Some persons who have heretofore tested the sweetened composition which has been offered them by old ladies, under the name of blackberry, will perhaps smile at this suggestion, but if they will take the trouble to make an experiment or two in the manner I am about to relate, they will find that wine can be made from blackberries; and that while we have been searching all over the world for grapes that can be naturalized, with the view to supply ourselves with that very desirable beverage, a fruit which grows plentifully at our own doors, and which is admirably adapted for that purpose, has been entirely overlooked.

When the berries are ripe they should be rubbed between the hands or with a wooden masher in some suitable vessel, until the cells containing the juice are thoroughly broken. They should then be placed in a tub—one that is deep and of not very great diameter is probably the most suitable—and to each gallon of berries add from one to two pounds of sugar. After mixing the berries and the sugar, add for each gallon of berries one quart of boiling water. They should then be kept in the tub about twenty-four hours. The heat imparted by the boiling water will cause a fermenting process to start immediately, without the assistance of yeast or any other ingredient. The liquid should be occasionally stirred, and the seeds and skins, most of which will rise to the surface, should be skimmed off. At the end of twenty-four hours the juice should be run into a cask. Whatever remains of the seeds and skins may be strained through a cloth. When the cask is filled, it should be placed in a cellar or some cool place with the bung-hole open. Some of the juice should be kept in a convenient vessel, that it may be added every day to the liquid in the cask, to keep the cask constantly full, so as to allow the scum raised by fermentation to pass off. When the fermentation has progressed sufficiently, which will be in a week or ten days, the cask may be bunged up tight and treated as other wine.

Common brown sugar of fair quality will answer very well. The quantity of sugar should be graduated according to the body which it is desired to impart to the wine. I have now some wine, made in this way last summer, in five-gallon demijohns, with 2 lbs. of sugar to the gallon, and which has never been bottled, but used as it was required from the demijohn, which is entirely free from acidity, and is really an excellent wine of good body and flavor. Not a drop of alcoholic spirits or anything whatever has been added to it after the process above mentioned.

I had some other wine, made in the same way, but with a less quantity of sugar, which strongly resembled claret; but was much better than any of the ordinary French claret to be obtained in this country. I think it very probable that, by varying the process—adding more or less boiling water, and permitting the fermentation to progress for a longer or shorter period—wine of various qualities may be obtained.

From each gallon of berries treated in the above way, about one gallon of wine is obtained. The cost of gathering the berries will not average more than ten cents, and the cost of the sugar will be from eight to sixteen cents, according to the quality used. Here then is wine that will not cost more than twenty-five cents to the gallon, and in the country where the children will pick most of the berries, the real outlay will not be more than from eight to sixteen cents. What, then, is to prevent the farmers from having their own table wine, and plenty of it? That the juice of the blackberry contains all the essential requisites for making a good wine, is absolutely certain. That a very superior wine may be made from it by proper treatment, is quite probable. Try it.

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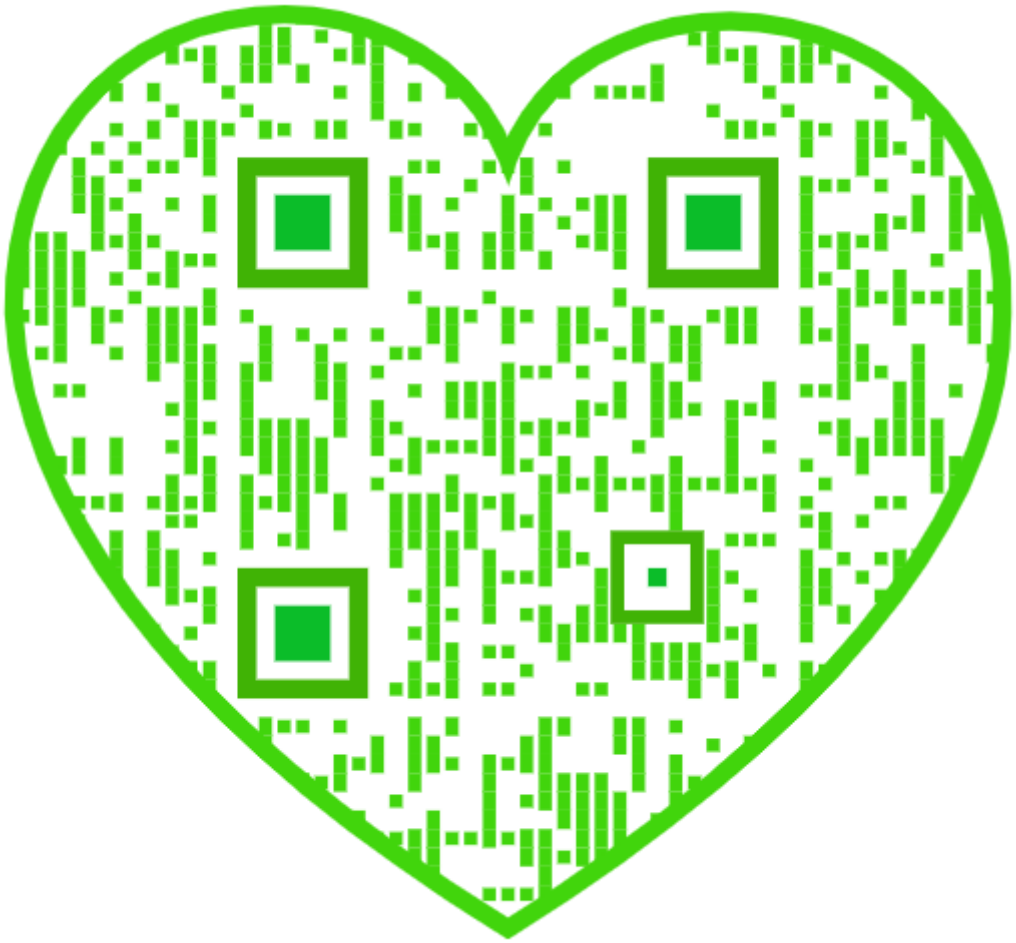

## A RAILROAD UNDER GOVERNMENT MANAGEMENT.

Turning my back upon the sad remains of the Direct Burygold Railway, I proceed at once to the rival Great Deadlock line, which has now been taken under the permanent management of government. Here at least is life, if not activity; and the great terminus looks very different to what it did when it was simply a public joint-stock undertaking. The familiar policemen and guards are all gone, and in their places are many fat porters in leathern chairs, and messengers in rather gaudy liveries. The chief booking-office, once all bustle and energy, is now as calm and full of dignity as a rich Clapham conventicle. Its hours are short, and strictly adhered to, especially as regards the closing. While its work is decreased two-thirds, its clerks are increased one-half, and are dressed in a much more elegant and correct manner than they were during the days of its joint-stock existence. Literature is now more generally patronized; and the leading newspapers and periodicals are not only taken in, but diligently read during three-fourths of the short business hours.

The forms of application for tickets are much more elaborate than the old rude method of simply paying your money, obtaining a voucher, stamped instantaneously, and walking away. Every man who wishes to go to Burygold, or any intermediate station, must apply for a printed form; such application to be countersigned by at least one respectable housekeeper. The form has then to be filled up according to certain ample printed directions, which occupy about a folio page and a half. The man who wishes to go by rail to Burygold, or any intermediate station, must state his age, must say whether he is a Dissenter or a Church-of-England man, must state whether he is a housekeeper or a lodger; if the first, how long he has been one; if the second, of what degree; must state whether he has been vaccinated; whether he has had the measles; whether he has had any tendency to lunacy, or whether his parents have ever exhibited that tendency; must say whether he has ever been to Burygold, or to any intermediate station, before, and if so, how many times, and upon what dates, and upon what business; must state what is his present object in going to Burygold, and how long he is likely to stay; must state the exact weight of luggage he intends to take, and what the nature and contents of such luggage may be; must state the number of his family (if any) and the ages of his wife and children respectively; and must send his return in, accompanied by a letter of application, written upon folio foolscap with a margin, and addressed to the Right Honorable the Duke of Stokers, Governor-general of the Great Royal Deadlock Railway. Having allowed three clear days, for verification and inquiries, the passenger may attend at the chief office of the Great Royal Deadlock Railway, between the hours of 1 and 3 P. M., and receive his ticket upon the payment of the fare authorized by the act of Parliament. If there be any informality in his return, he is sent back by the unflinching clerks. He has to go through the same form over again, and to wait another three clear days, before he again applies for a ticket.

With much exertion, the government of the Great Royal Deadlock Railway are enabled to start two trains during their working day, at an annual cost to the country of about eight thousand pounds per mile.

A number of grants and privileges have been made to many members of the governing class, who now hold positions and reside upon the line. There are the General Ranger, the Deputy Grand Ranger, the Secretary to the Deputy Grand Ranger; the Lord Marshal, the Under Marshal; the Lord Steward of the Coke and Coal Department, the Deputy Lord Steward; the Grease Master, Deputy Grease Master, and the Keeper of the Oil Cans. These officers have the privilege (besides grants of land upon the line) of running special trains for themselves and friends, without any formal notice to His Grace the Governor-general. This privilege has at present been sparingly used, and no particular accident has sprung from it, except the smashing of a plowman who was crossing the line, and the running, on one occasion, through the end wall of the London terminus, into the middle of the public road.

The Civil Service Staff of the Great Royal Deadlock Railway is the pride and glory of the country. Compare it now, for efficiency and completeness under government-superintendence, with what it was in the days of the late bankrupt joint-stock company. Every man who enters upon even such humble positions as stoker, ticket-taker, or porter, must be able to tell the names of the Kings and Queens of England, give a scientific analysis of coal (including the chemistry of coke) and of the theory of combustion, and must show some respectable knowledge of conic sections, trigonometry, and the use of the theodolite. The principal appointments are numerous, varied, and complete. There are fourteen Gentlemen Ushers of the Great Board Room, and one Assistant Usher; eight Grooms of the General Manager's Office, and one Assistant Groom; fourteen Pages of the Locomotive Department, and one Assistant Page; one hundred and fifty Inspectors of Stations, and one Assistant Inspector; one hundred and fifty Examiners of Bridges, and one Assistant Examiner; one hundred and fifty Surveyors of Tunnels, and one Assistant Surveyor; sixty Regulators of Refreshment Rooms, and one Assistant Regulator; ten Hereditary Grand Judges of Iron Girders, and one Assistant Judge; and fifty-six Gentlemen Lamplighters, with one Assistant Gent. The nameless crowd of minor officers are as numerous in proportion, and as carefully filled as the posts of trust and honor. The system of the Civil Service is carried into the minutest corners of the railway, and wherever there is a department with thirty or forty clerks, there is always to be found one assistant clerk. Every engine is manufactured upon the premises, by a body of workmen, overlooked by another body of surveyors. The cost of every locomotive is about double the price usually charged by a regular manufacturing engineer. To avoid even the remotest chance of accident by explosions from over-work, no engine is kept in use more than three months, and some not even that small number of weeks. So careful are the stoker and driver of the passengers' lives, that where there is the slightest chance of an accident from the obstinate refusal of a home-made locomotive engine to move on, rather than irritate it by a dangerous pressure of steam, they desert the unruly one, and the passengers walk with perfect safety to their destination along the tranquil and beautifully regulated line.

* * * * * *

Such are the Railway Nightmares that haunt me, and will not pass away.

## THOSE TERRIBLE ZOUAVES.

The following description of the Zouaves—the most efficient portion of the French army—is taken from the report of Capt. George B. McClellan, who was one of the United States military officers sent to the seat of war in Europe in 1855, to collect information on military subjects:—

The dress of the Zouaves is of the Arab pattern; the cap is a loose fez, or skull-cap, of scarlet felt, with a tassel; a turban is worn over this in full dress; a cloth vest and loose jacket, which leave the neck unencumbered by collar, stock, or cravat, cover the upper portion of the body, and allow free movement of the arms; the scarlet pants are of loose oriental pattern, and are tucked under garters like those of the Foot Rifles of the Guard; the overcoat is a loose cloak, with a hood; the Chasseurs wear a similar one. The men say that this dress is the most convenient possible, and prefer it to any other.

The Zouaves are all French; they are selected from amongst the old campaigners for their fine physique and tried courage, and have certainly proved that they are what their appearance would indicate—the most reckless, self-reliant and complete infantry that Europe can produce. With his graceful dress, soldierly-bearing, and vigilant attitude, the Zouave at an outpost is the beau-ideal of a soldier. They neglect no opportunities of adding to their personal comforts; if there is a stream in the vicinity, the party marching on picket is sure to be amply supplied with fishing rods, &c. If any thing is to be had, the Zouaves are quite certain to obtain it.

Their movements are the most light and graceful I have ever seen; the stride is long, but the foot seems scarcely to touch the ground, and the march is apparently made without effort or fatigue. The steps of the Foot Rifles is shorter and quicker, and not so easy and graceful.

The impression produced by the appearance of these two corps is very different; the Rifles look like active, energetic little fellows, who would find their best field as skirmishers; but the Zouaves have combined with all the activity and energy of the others, that solid *ensemble* and reckless dare-devil individuality which would render them alike formidable when attacking in a mass or in defending a position in the most desperate hand to hand encounter. Of all the troops that I have ever seen, I should esteem it the greatest honor to assist in defeating the Zouaves. The Grenadiers of the Guard are all large men, and a fine-looking, soldierly set.

The Voltigeurs are small, active men, but larger than the Rifles. They are light infantry.

## CLEAN AND DIRTY FIRE-ARMS.

It may be interesting to non-military men to learn something of the effects of clean fire-arms in the hands of fresh, or of dirty arms in the hands of wearied soldiers, and we accordingly make the following extracts from "Forbes' Volunteer's Manual":—

"Ordinary muskets, loaded with ordinary powder, cannot be discharged more than seventy-five times without having the barrel cleaned, because it will become so dirty that the ball will no longer enter the barrel, and even the touch-hole will become so foul that it will not communicate the spark to ignite the charges. As the barrel becomes dirty, more muscular efforts are required to drive home the ball, which injures the rotundity of the bullet, causes the hand to tremble, and makes the hand unsteady. The soldiers must recollect that the first twenty shots will do more execution than the remaining fifty-five; therefore, it is most important that those valuable chances be not thrown away by firing these from too far, fouling the barrel and wasting powder. At the commencement of the fire (the piece being clean) a soldier in the ranks may calculate that he will discharge one shot per forty seconds, which is three shots in two minutes. This refers to soldiers in two ranks in their regular places in the company; a picked man firing separately and singly, can do so quicker than it would be possible to do in the ranks. The men could, by hurrying, fire two shots per minute, or even five in two minutes, Since, however, hurry always creates more or less unsteadiness in the loading and aiming, smaller damage is inflicted upon the enemy by a fire averaging five shots per man for two minutes, than by a fire at the rate of three shots in the same period of time."

## RED LEAD ON IRON SHIPS.

The most esteemed paint hitherto employed for the hulls of iron-ships has been red-lead, which was held to be very effective in preventing oxydization of the iron and the adherance of barnacles. We understand that this confidence in red-lead paint was based upon experiments made with it a number of years ago by eminent English engineers, but we learn from the Liverpool (Eng.) *Albion* that recent experiments go to establish quite a contrary opinion of its qualities. It seems that Mr. Robert Lamont was lately employed by the managers of one of the largest steamship companies in England to report on the merits of certain compositions used to a large extent in Liverpool for persevering iron-ships, and the fouling of their hulls, and the result of his investigations, recently reported, is quite contrary to the popular notion on the subject, as it is stated that red-lead is the most pernicious pigment that can be employed. An iron-ship, the *William Fairbairn*, which was coated with red-lead just prior to a recent voyage to and from Calcutta, had her plates corroded in such a manner that they attracted his especial attention. On a close inspection he found the red-lead coating covered with blisters, each of which on being opened, contained a clear fluid which left a number of clear crystals of metallic-lead, adhering to the iron. It is stated that each of these minute blisters was a miniature galvanic battery, which induced chemical action, hence the great extent of the corrosion in the iron, it being the most oxydizable metal, the lead being negative. He also states that the sweating to which iron-ships are subject, is caused in a great degree by the use of red-lead paint in immediate contact with the iron, and he therefore recommends that its use be abandoned for iron-ships.

INFATUATED WORKMEN.—In our last volume we gave a brief account of a strike, which the shoe-makers of Stafford, England, had made against the introduction of sewing machines for executing some parts of the work on shoes, which have previously been done by hand. Quite recently these workmen, finding they could not intimidate their employers into compliance in abolishing machine labor, have adopted very reprehensible measures for preventing shoe-makers coming from a distance to Stafford, and to induce those journeymen which have still continued working, to give up their situations. No such scenes as these occur in our country; our mechanics are well aware of the fact that machinery is a general benefit to all classes, and to none more than the hard hand-working operatives.

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## METHOD OF ANALYZING TANNING LIQUORS.

BY SIR HUMPHREY DAVY.

The substances which have been supposed to exist most generally in ooze, are tannin, gallic acid, and extractive matter. The presence of tannin in ooze or any other infusion, is know by the precipitate formed on the introduction of gelatine, such as glue or isinglass. The process, however requires many very delicate precautions. Previously to the experiments, the infusions are materially effected by exposure to the atmosphere. The tannin contained in different vegetables demands for its saturation different proportions of gelatine, and the quantity of precipitate obtained by filtration is not always proportionate to the quantity of tannin and gelatine in solution, but is materially influenced by the degree of their concentration. Hence, it follows that the solution of gelatine for the analysis should be employed in as high a state of saturation as is compatible with their fluidity. They should be used only when quite fresh, and as their relative effects are found to be influenced by their temperature, it was found expedient to bring them, and the infusions on which they were designed to act, as nearly as possible to a common degree of temperature. Great care must also be taken to prevent any excess of gelatine.

Duly attending to all these precautions, the general result is, that in any given case where the quantity of gelatine in solution employed upon an astringent infusion is compared with the quantity of precipitate obtained, the difference between them may be considered as the proportion of tannin contained in the infusion.

The tannin being thus separated, it remains to ascertain the proportion of the two other ingredients in the infusion by gallic acid and the extractive matter. The first step here is slow evaporation, by which the latter substance is in part rendered insoluble, so as to subside at the bottom of the vessel. A proportionate quantity of alcohol being next poured upon the fluid, thus reduced to a thick consistency, both the gallic acid and the soluble extractive matter, if there were any remaining in the infusion, were dissolved. The great difficulty now was to separate the gallic acid and the extractive matter. Ether and alumina were tried without the desired effect, the affinities of these two agents wtih those substances not being sufficiently distinct to produce the separation. Some judgment may, however, be formed by means of the salts of alumina and the oxygenated salts of iron. Muriate of alumina precipitates much of the extractive matter from the solutions without acting materially upon the gallic acid, and after this precipitation some idea may be formed concerning the quantity of gallic acid by the color it gives with the oxygenated sulphate of iron.—*Shoe & Leather Reporter*.

## THE DUDLEY OBSERVATORY.

The Trustees of this Institution at Albany, N. Y., have issued the following statement of its present condition and future prospects:—

"The Trustees have the pleasure to announce to the patrons and friends of the Dudley Observatory that Professor O. M. Mitchel, of Cincinnati, has accepted the office of Director of the Institution, and is now discharging the duties of that office.

Dr. Francis Brunnow, of Ann Arbor, Michigan, has accepted the office of Associate Director, and has already commenced observations, assisted by Mr. Sonntag, Astronomer of Kane's Exploring Expedition. Professor Mitchel and Doctor Brunnow will both reside at Albany, but the Cincinnati Observatory will, for the present, be under the direction of Professor Mitchel. Doctor Brunnow's journal, the *Astronomical Notices*, will hereafter be published in the city of Albany. The Trustees deem themselves fortunate in securing the services of gentlemen of such well established fame, whose names command the respect and confidence of all friends of science in this country and in Europe. The Observatory will now commence activity under the most favorable auspices. The great meridian telescope has been adjusted and brought into use. A transit telescope, of the largest size, to be placed in the west wing of the Observatory, has been ordered, together with all the other instruments and apparatus necessary in a first-class Observatory.

The Observatory buildings and dwelling-house, land donated and purchased, instruments, apparatus, library, &c., are valued at $85,000. Moneys invested for the support of the Observatory, $65,000."

Doctor Brunnow will conduct the *Astronomical Notices*, the last number of which contains the first recorded observations made with the Olcott meridian circle.

## BATTEL'S FURNACE FOR HEATING TIRES.

In heating tires in an ordinary fire, either a very large quantity of coal has to be used in consequence of the size of the fire or the tire must be heated piecemeal, which scarcely effects the objects of heating. The invention, of which Fig. 1 is a transverse vertical section, is an improved furnace for this purpose, which was patented April 19, 1859, and which we will proceed to describe.

The body, A, of the furnace forms an annular space, B, the bottom of which is perforated with holes or openings, *a*, through which the air can have access to the fuel in B, in order to raise a fire. C is a central tube, covered by a plate, D, that serves to regulate the draft of the fire in B. A piece, E, is cast on one side of A, in which the rod, F, is secured, on which the crane, G, rotates freely, and the upper edge of A has a groove, *b*, running round it that forms the resting place of the hood or cover, H. This cover is of the usual form—a cone, *c*, and smoke-stack, *d*—high enough to gain the requisite draft. The

Fig. 1

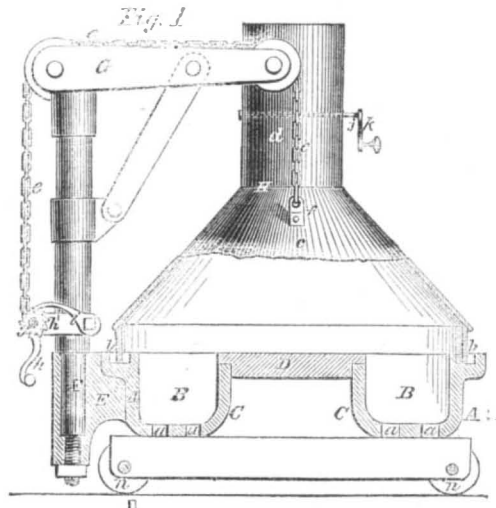
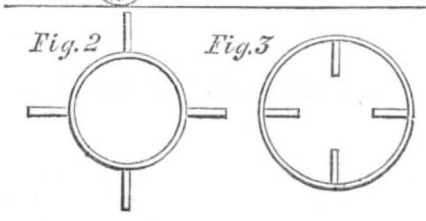



Fig. 2 Fig. 3



cover is attached to the crane by chains, *e*, secured at *f* to the cover and passing over pullies on the crane to the winch, *g*, that is provided with a handle, *h*, a ratchet-wheel, *h'*, and pawl, *i*, so that H can be retained at any hight above the fire. In *d* is a damper, *j*, that is operated by a crank, *k*. Figs. 2 and 3 represent rings which have arms, the one set projecting outwardly, the other inwardly, from the periphery or ring. Fig. 3 fits over the central tube, C, in the furnace, and this ring is used if a small tire is to be heated, and the tire being placed on the arms, the fire is raised on the inside of this ring only. Fig. 2 has arms which extend far enough to reach the outer side of the annular space, B, and it serves for heating longer tire, the fire being raised on the outside of the ring only. By placing these rings into the furnace the fire-space is diminished, and, consequently, less fuel is required to fill it, and at the same time the draft is not obstructed, as the arms cover but a small amount of space. The body of the furnace may be constructed of cast-iron, and placed, as shown, on wheels, *n*, or it may be made of brick and stationary. The crane can be used to manipulate heavy tire, placing them in the fire and taking them therefrom. Fuel and time are thus saved, and the tire is heated so even and malleable that it drops on the wheel without striking or bruising it, and if the wheel is kept wet it is not charred at all. It is especially useful for railroads, where the tire should be heated with regularity to ensure an even texture of the metal.

Any further information concerning this useful device can be had by addressing the inventor, Mellen Battel, of Albany, N. Y.

THE LARGE CLOCK.—The clock in the new Houses of Parliament, London, is now going, and it has cost the nice little sum of $101,535, of which the clock itself and dials cost $41,395, and the bells $29,830, the remainder having been expended in experiments and fixing.

## SUPER-HEATED STEAM.

The Peninsular & Oriental Steamship Company have caused some experiments to be made on one of their ships, the *Valetta*, for the purpose of testing the value of super-heated steam, and the possibility of working their engines by that agent instead of steam as commonly used. The device of Mr. Penn deserves notice. He places in the smoke-box of the boiler, through which the hot-air from the first passes, as large a number of small pipes as is consistent with allowing a free draft from the furnaces. Through these all the steam passes on its way from the boilers to the cylinder. By this plan an immense heating surface in the pipes is secured; the steam is in a subdivided form, so as to be readily acted upon, and the waste heat from the furnace is utilized at the point where its intensity is greatest, and great convenience exists for applying the apparatus. The whole contrivance can be shut off from the engine at pleasure by three ordinary stop-cocks. The temperature in the smoke-box is about 650°, and it raises the steam to about 350°, or 100° above the temperature due to its pressure. Singularly enough, a smaller amount of cold water is required to condense steam at this high temperature of 350° than at the ordinary one of 250°.

## TRANSPLANTING EVERGREENS.

The *London Gardener's Chronicle* describes the following method as promising great efficacy in reviving plants dried by having had their roots too long out of ground, and in ensuring their safe removal in late spring and summer, and as being especially fitted for evergreens when transplanted.

"Make a hole in the ground to contain about 20 gallons of water, and pour about 16 gallons into it, add to this about 20 lbs of barnyard manure mixed with about the same quantity of fine rich soil. By working the mixture for a long time, and carefully, you reduce it to the consistence of whitewash. In this mixture steep the roots of your plants, just before putting them into the ground; the earth thrown after them into the hole sticks to the roots, which immediately begin to swell. At the very first movement of sap, rootlets appear through this coating, which gives them immediate manure, and not only brings on, but secures, the further formation of roots. Once fairly started, there is nothing more to fear." This reminds us of the plan for encrusting seeds with manure in order to give the seedlings a good start, recommended by an ingenious gentleman at New Orleans.

## SUMMER DRINKS.

SHERBET:—Eight ounces of carbonate of soda; six ounces of tartaric acid; two pounds of loaf sugar, finely powdered; three drachms of essence of lemon. Let the powders be very dry. Mix them intimately, and keep them for use in a wide-mouthed bottle, closely corked. Put two good-sized tea-spoonfuls into a tumbler; pour in half a pint of cold water, stir briskly and drink off.

RASPBERRY, STRAWBERRY, CURRENT, OR ORANGE EFFERVESCING DRAUGHTS:—Take one quart of the juice of either of the above fruits; filter it, and boil it into a sirup with one pound of powdered loaf sugar. To this add one ounce and a half of tartaric acid. When cold put it into a bottle and keep it well corked. When required for use, fill a half pint tumbler three parts full of water, and add two table-spoonfuls of the sirup. Then stir in briskly a small tea-spoonful of carbonate of soda, and a very delicious drink will be formed. The color may be improved by adding a very small portion of cochineal to the sirup at the time of boiling.

TO DESTROY INSECTS ON TREES.—A solution of whale oil soap will destroy the numerous insects that infest trees and shrubbery at this season of the year. Dissolve the soap in warm water, making "suds" of medium strength, and sprinkle the leaves with a syringe. This specific is sure death to the caterpillar, miller, and the army of ravagers that destroy the foliage. Now is the time for its application.

COFFINS.—In England they are imitating the most ancient of all coffins, and are making many of terra-cotta and similar materials. They are of the ordinary shape, and the lid fits in a groove where it is secured by Roman cement. The ancients knew better than this; they did not want them to explode, so left free egress for the gases of decomposition.

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## INTERESTING CORRESPONDENCE.

### PRESSURE ON SLIDE VALVES.

MESSRS. EDITORS:—Much has been said and written relative to the amount of power required to operate the slide valves of steam-engines, but one fact seems to have been overlooked by all who have made anything public on the subject. Some persons contend that the pressure is equal to the whole face of the valve, while others are equally confident that it is only equal to the ports under the valve. I think that both may be right and both wrong. If we take an engine in which the valve is moved suddenly by means of a cam and then allowed to stand still during half of the stroke, then I think the pressure is equal to the whole face of the valve; but if it is moved by an eccentric which gives it a continuous motion (except at the changing points), then its pressure is only equal to the area of the ports under it. The following is the reason assigned for this action:—

When the valve is in motion, minute globules of water always find access between the face and the seat of the valve, and these allow some steam to pass under the valve and relieve the pressure upon its back; but when the valve is allowed to stand still, these globules of water escape down the exhaust ports and the steam is then excluded from between the valve and its seat, when the pressure of the steam, as a matter of course, becomes equal to the whole face of the valve in contact and area of ports in addition. The proof of this may be had in any engine-room where the engine is worked by means of a starting bar. If the engineer works the bar quickly at the commencement of the stroke and then waits for the stroke to be finished, as is usual in working engines by hand, he will be surprised at the amount of power required; if he now gives the bar a continuous motion, the same as an eccentric, the difference will become obvious. In a condensing engine, using a slide valve, more power is required to move it than the slide valve of a non-condensing engine, from the fact that the atmospheric pressure being removed in the former, the globules of water referred to are excluded from between the exhaust side of the valve and its seat. This affords an explanation of the fact that the valve seats of low pressure engines wear out more rapidly than those of high pressure non-condensing engines. In order to make slide valves move easily, they should be so arranged that no motion should be lost between the crank and the valve.

GEO. H. REYNOLDS.

New York, July, 1859.

### OBSERVATIONS ON HEAD VENTILATION AND HYGIENE.

MESSRS. EDITORS:—The ideas advanced in your issue of the 18th ult., relative to *ventilating hats*, have been advocated by me during many years, but within only a year or two has there been an attempt at its becoming a custom. I have frequently been asked why I kept my sitting and bedroom windows down both winter and summer, and why I had such a large hole in my hat. The first of these questions you have answered fully, but the latter not satisfactorily to me, and on this I beg to make a few remarks, which I know will be appreciated by parties acquainted with the nature and power of steam and hot air. That there can be no ventilation in the hat unless there are "perforations at or near the band to secure the inward passage of air," I must beg to deny. The atmospheric pressure caused by the great and continual heat of the head, which is ever creating hot air and emitting steam from ten thousand pores, forces a draft through the ventilator that can be *seen* by causing a person wearing the hat to stand in a sunbeam in a room, when the dust will fly upwards from the ventilator. Suppress this atmosphere, and the pressure on the head when in a perspiration becomes intolerable, and the hat must come off. Hence the necessity for ventilation. If this sensible fashion would become a general, necessary custom, men would not become bald any more than do women.

The furnaces in our modern dwellings will force upon us the necessity of building our houses with ventilators in every room for the escape of foul gas, hot and poisoned air, dust, &c.; and when we shall have got well into the business, with its variety of expenses, both ornamental and useful, we shall have learnt that furnaces must be abolished. Churches and other public edifices used only occasionally may be heated by hot air, but furnaces in private dwellings will hourly destroy the health of our women and children. Hot air, with delicately or indelicately bare shoulders, bare arms, and thin clothing, contributes largely to our cemeteries, increases the number of bald heads, decayed teeth, and black-craped hats, the consequences of over-indulgence in hot coffee, tea, and ice-water, taken alternately during the term of our *un*-natural lives. Yet all common sense and health must yield to fashion and the "grim tyrant, Death."

If cholera in this city contributed to the grave as liberally as does consumption, the people would fly the metropolis; but the still, smiling, silent, subtile searcher of almost every family of *grown* sons and daughters is welcomed; the poison he administers in all cases is agreeable, and adds to the romance of almost any foolish novel; there is a charm to its melancholy (for consumptive victims are indispensable in pretty novels), as they appeal to the feelings of the *bereaved* masses; and so long as we continue to dig down into the ground and fill our houses with foul air, we shall be able to furnish interesting subjects for truthful novels, written on almost every family in this city.

Man was never intended to live under the ground; he is evidently an over-ground animal; but some of the brute creation, intended for his use, can only be found in dens and caves of the earth. Some architects in New York are becoming ridiculous by planning houses with as many rooms below the street-surface as above it. Now, there are two extremes, the high and the low. Constantly breathing the damp air of cellars creates consumption, while climbing to the top of five-story houses creates a complaint in women that is best known to physicians. We will reduce this science down to the simple rule-of-three, as "figures never lie." If the foul air of a cellar 40 feet deep will kill a man in ten minutes, how long will it take the foul air of a cellar 10 feet deep to kill him?

To keep ourselves healthy and comfortable we must wear warm clothing in-doors, keep the air cool, shut our well-ventilated cellar-doors tight, wear ventilated or cooler hats and all our hair, be satisfied with one beverage at a time, and preserve our teeth, else the above-named abuses will become chronic throughout the land.

J. C. BATTERSBY.

### SPEED OF CIRCULAR SAWS.

MESSRS. EDITORS:—I have had an experience of five years in running circular saws, and I think there is a great advantage secured in running them fast. The mill in which I am engaged has only 12 horse power to drive, and the saw runs at the rate of 6,720 feet per minute. There is another mill in the neighborhood which has 20 horse power to drive, the saw of which runs only at the rate of 1,400 feet per minute. Both saws are four feet in diameter. Our mill cuts double the amount of lumber that is accomplished in the one with 20 horse power. I believe that a four foot saw may be run at the rate of 8,000 feet per minute with good advantage. To drive at this speed and not waste power, the governor should be very sensitive, so as to operate the throttle valve of the engine and make the latter run slower when the saw is not cutting.

J. J. W.

Marianna, Fla., June, 1859.

### SETTING OF CIRCULAR SAWS.

MESSRS. EDITORS:—Owing to various causes (the most prominent of which are imperfect construction and adjustment of the saw and mandrel) the plate of a circular saw will always vary more or less from its proper plane, thus causing the saw to cut a kerf wider than it otherwise would, and involving imperfect work, loss of lumber and loss of power. The best method of setting circular saws, so far as my experience goes, is as follows:—Adjust the saw-plate as nearly as possible to a plane at right angles to the axis of motion, and let the mandrel have no end play. Now, revolve the saw so as to touch very slightly the point of a file held securely at the base of the teeth at right angles to the saw, and thus find out that portion of the saw-plate which varies most from a plane intersecting the center of the saw and at right angles to the axis of its motion. Now mark the portion of the plate thus found and give the tooth at that part a very little set, barely sufficient to keep the plate from rubbing the walls of the kerf. The file should now be fixed so as to graze crosswise the point of the tooth. All the teeth are now set by bending to the point of the file, so that they may all graze it equally as they revolve. Having thus set both sides of the saw, it will be found to cut much faster, smoother, straighter, and with less vibration and noise, and it will also cut a much narrower kerf. This method of setting saws diminishes the number of planes of motion described by the outer corners of the teeth, and brings them nearer together.

A common circular saw may be made to cut a kerf of any width, from one to six inches, by simply increasing its inclination to the axis of motion, an example of which is given in Harrison's Tenon-saw, illustrated on page 33, Vol. XIII., of the SCIENTIFIC AMERICAN. This method is original with me and probably with many others, but is, I think, not so generally known as it ought to be.

E. P. B.

Athens, Maine, July, 1859.

### THE INVENTOR OF STREET RAILROADS.

MESSRS. EDITORS:—Your motto relating to inventors I believe is, "honor to whom honor is due;" and with this motto in view, I will merely call your attention to two patents, dated on the 23d of August, 1831, one of them for a "new and useful improvement in the mode of *turning short curves* upon railroads;" the other for the "mode of forming and using *cast or wrought iron plates or rails for railroad tracks in cities* and elsewhere."

You will please bear in mind that these patents were obtained before a passenger-railroad was in working existence in this country, and long before the introduction of tracks into cities had been seriously contemplated by any railroad company. Yet here are two patents for the very improvements you have so justly appreciated, invented by a then resident of your city in 1828, who lived on the corner of Charlton and Macdougal-streets, and who removed to this city in the year 1829, and brought with him a model of a street, with the *grooved* rails shown along it, and the *identical short curve*, with the flat rail to receive the flange, and increase the diameter of the outer wheels whilst turning the corners. There was also a "turning platform" on the same model, and a "self-acting switch." You will see a copy of this model, now in the Patent Office, restored after the fire. What makes these inventions the more remarkable, is the fact that the inventor, long before they were needed, conceived the simplest and most practicable form of the whole system of street railroads, and that which now, eight years after his death and thirty-one years after his invention of them, is being appreciated. That inventor, as you will see by referring to the patents, was the late James Stimpson, and the Harlem Company paid him for the right to use these patents. I could also give you the history of the power-loom he invented and sent to Russia in 1817, by order of the Russian Minister, and a great number of his other inventions, but not being the subjects in question in your article, I close with the belief that, acting in accordance with your motto, you will at least give his name the credit which is justly belonging to him.

JAMES H. STIMPSON.

Baltimore, Md., June 30, 1859.

### CHLORIC ETHER DISINFECTANT.

MESSRS. EDITORS:—On page 301, Volume XIII, SCIENTIFIC AMERICAN, several suggestions are made in reference to disinfecting foul ships, and a rather troublesome plan recommended to produce a discharge of chlorine for this purpose, after having secured the hatches down and closed the crevices in the usual way. A better way, allow me to say, is to close the vessel, as all who have the control of vessels are supposed to understand how to do; and burn in glass-lamps, properly distributed so as to reach every point, a quart or two for a small vessel of chloric ether.

The chlorine becomes liberated and penetrates every crevice, and even the pores of the wood, "filtering the air," if I may so term it, and rendering it sweet and healthy. If any one is disposed to test it, let him try it upon the foulest air he can find; of course I do not mean in the open air; a room of ordinary size may be disinfected so far as odor is concerned or *deodorized* by simply closing the doors and windows, and burning a lamp of chloric ether five minutes; no one need leave the room. Lamps for this use should be of glass, the common ones for camphene are suitable, and the ether may be treated precisely as the "Ethereal Oil" usually is. A lamp with a wine-glass of the ether is entirely harmless, and may be kept ready for use.

I furnish every vessel I employ with a pound of chloric

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ether and a glass spirit-lamp. Five minutes use of this will entirely remove the smell of bilge-water, or other disagreeable odor from the cabin; but unless the *cause* is removed, the lamp may require to be frequently used. Try it. R. H. A.

Baltimore, Md., June, 1859.

[We are much obliged to our correspondent for the information contained in his letter. No method could be more simple for disinfecting ships, hospitals, and households, but at the same time, the hint contained in the last clause of the letter must not be forgotten.

## LOCOMOTIVE BOILERS---POST OFFICE MISMANAGEMENT.

MESSRS. EDITORS:—I sincerely wish that some of your numerous readers connected with railroad engineering could explain the cause of the choking-up of the water-passage in a locomotive boiler at the one side when hard or limestone water is used. Several cases of this kind have lately occurred here, and one on an engine which had been running only about nine months. The termination of the passage through the upper or check valve became diminished to about three-eighths of an inch, and caused the bursting of a cast-iron air-chamber half-an-inch thick; it being on the right or working side of the engine, the left-hand pump being seldom used. One would naturally suppose that the passage from the pump which is almost in constant use would be most likely kept open, but it is not so, and it would be very gratifying to know the reason of this.

There is another question, and one of a very serious character, which I wish to bring to the notice of those who can remedy the evil, namely, the mismanagement of the Post-office in the safe and prompt delivery of the SCIENTIFIC AMERICAN; other papers, however, are subject to the same trouble. Scarcely a week passes but one or more of your subscribers in this place are minus of their papers, while on other occasions, papers belonging to persons residing in other places are received; clearly showing that the fault is in the Post-office. It is very annoying to be thus disappointed, and to hear the remark often made angrily, "what has become of our paper this week?"

A new-comer in this place called frequently, but vainly at the Post-office for letters and papers, but found none. At last he became clamorous, and demanded a search to be made for them, when lo! a number were found snugly situated on an upper shelf. His name not being familiar to those who assist the postmaster in his duties, the owner came very near losing both papers and letters.

ENGINEER.

Knoxville, Tenn., July, 1859.

[To the inquiry of our correspondent in regard to the incrustation forming on the interior of the water-pipe in the boiler, we can only say that hard water forms incrustations in all metal pipes, even when it is moving at a considerable velocity. The amount of scale formed is proportional to the amount of water passing through, especially if aided by heat. We advise all our railroad companies to use nothing but soft water for their locomotives; and if they cannot obtain a sufficient supply from springs or creeks, let them erect cisterns at the stations to catch rain water for that purpose.

The case of mismanagement in the Post-office we refer to the attention of Postmaster-general Holt. We believe he will not allow it to pass without inquiry. We are confident that the general circulation of many newspapers is greatly affected in every place where there is an unfaithful or incompetent person in charge of the Post-office, and we have therefore a just cause of complaint as well as our subscriber.—EDS.

PUMP FOR AUSTRALIA.—In No. 35 of Volume XIV. of the SCIENTIFIC AMERICAN, we published a letter from Messrs. Fisher, Ricard & Co., Melbourne, Australia, in reference to a pump for deep mining. We have since learned that this firm can be addressed at No. 56 South-street, New York.

A HUMANE INVENTION.—It is announced that an inventive Yankee has produced an apparatus which he claims is a cure for snoring. He fastens upon the mouth a gutta-percha tube, leading to the tympanum of the ear. Whenever the snorer snores, he himself receives the first impression, finds how disagreeable it is, and of course reforms.

## DEATH OF A PROMINENT INVENTOR.

[Communicated.]

Walter Hunt, who has been an originator for about fifty years, has been at last relieved from that shell of earth and has passed to the future, where the annoyances of human strife can no longer torment the head or heart. From early childhood he exhibited signs which told that his destiny was that he should be a teacher, an almoner to the grieved ones, rather than a servant of self. His earliest practical workings were in mechanical movements, the breech-loading cannon being one; from this he, after much experiment, succeeded in making the breech-loading many-chambered pistol, usually known as the "revolver" at this day, and upon which others, by dint of perseverance have reaped the reward which justly belonged to him. The experiments in endeavors to control the lightning-flash of electricity so far back as 1833, as a motive-power, were as nearly successful as the then known circumstances would admit, and to this day have but slightly advanced. At about the same time, on the very spot where the *Sun* Office now stands, he experimented with a very crude machine for spinning flax, with such success that by imitations and innovations it has in other hands become one of the most valuable machines in that department of treating fabrics.

That he was the first inventor of the sewing-machine there is no doubt, inasmuch as in a contest with Howe, during the term of Judge Mason as Commissioner of Patents, he opened an interference against Howe, but unfortunately he had sold the invention to a Mr. Arrowsmith, therefore, the Commissioner decided as follows, in substance, viz: "Walter Hunt was the original and first inventor of the sewing-machine, but inasmuch as he had sold all his right, title and interest, and neither himself nor his relations had prosecuted the business to the advantage of the public, the community had not been benefited, and that Howe by persevering had made it valuable, and therefore must be sustained."

While I have not space to describe it, it is certain that his machine for forging wrought-nails has never yet been superseded, although many patents have been subsequently granted in hopes of so doing. His machine for cutting brads from the sheet-metal was exhibited at the American Institute Fair in 1835, at Niblo's Garden, simultaneously with his machine for punching leather and filling the holes with wire-plugs, so that the leather should support the metal, thus producing an iron and metal surface for a durable sole of a shoe or boot. Prior to this time he had experimented in preparing concrete blocks for the purpose of making docks, &c., which would be permanently lasting, and one of his latest griefs was (as expressed to the writer), that more than twenty years ago he explained this plan of building docks to Peter Cooper, who but a few months ago put it before the public with a view that it would appear to have emanated from himself. Another effort was the molding paper-boxes directly from the pulp, by having a female-mold into which a corresponding male-punch or piston would so nearly fit as to form the boxes at one operation, thus making a box per second. The vapor-bath was, as a medical instrument, extremely valuable at the time he introduced it.

The hollow rifle-ball having a conical-shape, with a sharp point, and the charge within the ball, was a beautiful chemical and mechanical discovery, yet it met no favor until Minie, in France, had adopted it to use, and in consequence he received the credit which belonged to Walter Hunt. Not content with his former experiments in fire-arms, he to the very latest hour continued to exercise his brain in relation to this class of instruments. The latest and probably the best of his improvements in this line was to arrange a new priming which would always be safe, it being water-proof and arranged in sticks, so that as the hammer came down to discharge the piece it would cut off a little piece, and the final closing of the hammer would cause the little piece to explode, thus igniting the powder or the charge in the ball, which would cause the displacement of the ball so that it would go to the intended destination. He also had an invention for reducing tobacco stems to a pulp, after which they could be rolled into shuts like paper, and thus formed into the most elegant segars. It was in his early days that he suggested the roller as a substitute for the old-fashioned balls for inking the form on the hand printing-presses, this being before power-presses had come into use. He was successful in preparing a paper-pulp which, when rolled on to or combined with the coarsest cotton, would appear like the finest linen for collars, bosoms, &c. His several medicines, of which his life-invigorating cordial is one, have proved extremely valuable.

Although what the writer has here enumerated are scarce a tithe of his inventions, which covered every branch of mechanical art, chemistry, and science, yet fearing to become tedious I will be content that there is sufficient for the present occasion and purposes.

Walter Hunt, like most inventors, devoted his life more to his friends than himself; the writer has frequently seen him give his last cent to the poor when he knew not where the next was to be found for himself; and the succoring of families in distress was his most holy thought; it was thus that all who knew, knew but to love him, no friend in need could want when he was supplied. In early life he became a free and accepted Mason, which undoubtedly contributed to his disposition to be philanthropic. He struggled with that monster, the dollar, all his life, in hopes of mastering it, but his almost numberless experiments kept him always comparatively poor. At the time of his death he was engaged in experiments which seemed to promise a rich reward for his past labors, but his long and ardent devotion, by night as well as by day, resulted in an attack of pneumonia, which in four days closed his earthly existence at the age of sixty-three years, thus parting the spirit from the house of clay that it might be wafted to the realms of bliss.

J. L. KINGSLEY.

[Our correspondent, takes the unqualified position that Walter Hunt was the original inventor of the sewing-machine. When this assertion appeared in the *Tribune*, Mr. Howe denied the fact, and quoted from the decision of Judge Sprague to sustain his position.

## BARKING FRUIT TREES.

We have received several letters on this subject, having been called out by the article on page 328, of Volume XIV., SCIENTIFIC AMERICAN, in which it is stated that if the entire bark to the wood of the trunk is removed, it would be fatal to the life of trees. In reference to this opinion, Mr. John Gill, of Patmos, Ind., says: "Paradoxical as it may seem, if apple-trees are skinned after the sap is well up and the leaves developed, they will form a new bark and flourish afterwards as well as if not barked, and perhaps better This is frequently done in the West to cure what is termed *bitter-rot*; a disease that attacks apples with small black spots, which run into the core in a conical-shape, and which are intensely bitter. How barking would operate on other trees I cannot say, but I saw this done twenty-five years ago."

In another letter on this subject from Mr. J. B. Sawyer, of Manchester, N. H., he says: "It is doubtless true that, in eleven months out of the twelve, it will kill a tree to strip it of its bark, but there are a few days in the month of June when many kinds of exogenous trees may be deprived of their bark (including even the liber, or inner coat), without causing the death of the tree. By a beautiful provision of nature the cambium, or jelly-like substance, which is ordinarily developed every year into a new layer of wood, will, if not injured by the operation of peeling, or by a too scorching sunshine, become a new bark. It will be very smooth and tender for a few years, in fact much like the bark on the young shoots of the same tree. It is possible that such a new and healthy bark may, in a few years, more than compensate a tree for the shock which such an unnatural operation must produce. This phenomenon may often be observed where a tree has been accidentally deprived of a portion of its bark at this season of the year."

We have seen old decaying pear and apple-trees renovated by scraping off the outside bark, and leaving a thin rind adhering to the wood, which was washed with soap-suds, containing a little sulphur. The *bitter-rot* in western apple-trees, we think, may be cured by such an operation. Although, according to our correspondents, some trees at certain periods of the year may be denuded of their entire bark to the wood, yet it may be truly stated that this operation is one which is likely to be fatal to the life of the tree, and is not therefore to be recommended for general practice.

BOUND VOLUME.—The SCIENTIFIC AMERICAN in its present form will make a very handsome volume at the end of the year, and we counsel all to preserve their numbers in a cleanly condition for that purpose.

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## MENEELY'S BELLS.

The bell has ever been a subject on which the poet can dwell with delight, for its music is so inspiring and its associations are so rich that any man not having a heart as hard as the clapper must be affected with its melody and the stories which it rings out over the crowded city or sequestered vale. Longfellow was in his happiest vein when he wrote "The Belfry of Bruges," and Poe is most strange and fantastic in his poem on "The Bells." And so we might go on indulging in the train of thought that our engraving suggests, and which represents a new method of hanging bells, so that a common bell cast with horns can be turned upon its vertical axis without unhanging, so as to present a fresh surface to the blow of the clapper when when desired. The methods hitherto proposed to effect this purpose have required some alteration in the shape or form of the horns, or have required only one bolt to suspend the bell, which is not so safe as a number of bolts. With this system the horns have not to be altered in shape, and there may be any number of them. The security of the yoke-fastening in a bell of considerable size is of great importance, since the fall of such a ponderous body from so great a hight as the belfry of a church, when the ringers are directly under it, is almost sure to produce some disastrous consequences. A single bolt may be made large enough, but it is impossible to tell what flaws there may be in the metal, and hence the small bolts are preferable. The bell may be turned once in two years, or not so often, and the small amount of trouble is not be mentioned when compared with the increased durability of the bell, from the tendency to crack and wear unevenly being so much diminished.

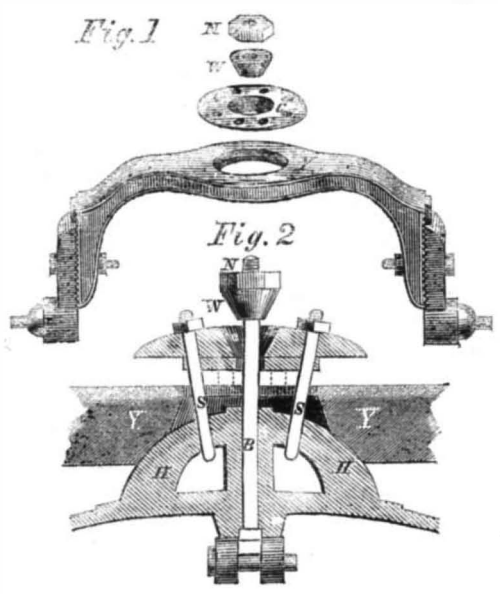



Fig. 1 shows the separate parts of the device and Fig. 2 a section of a bell and the hanging attachments. The ends of the yoke, Y, are notched externally, and the notches fit in corresponding ones in the pivot arms to which they are secured by a screw and nut. Should the bell, when first mounted, require too much labor to ring it, then, by raising the arms, thus bringing more of the weight above the axis to counterbalance that below, the force required may be diminished at pleasure. This may be done when the bell is hung. The turning of the bell is effected by means of the cap, C, which rests on Y, being raised from it in the illustration to show the projecting rim on the under side by which it fits snugly into Y, and yet is free to be turned. This rim and the outer flange of the cap form a shoulder having a vertical and horizontal bearing, which gives it a firm support; the bell being held up by the four U-shaped bolts, S, which pass under the horns, H, and also by the center bolt, B. All that is necessary in order to turn it is to screw back the nuts of these bolts a little, so that the horns do not bind in the yoke; then, by taking hold of the edge or putting a lever in at the horns, it may be turned; the cap, C, turning with it entirely round the circuit of its circumference, or as far as may be desired. This being done, first screw down the nuts of the staple bolts; then turn back the clapper and spring to their former position at right angles with the yoke, and again screw down the nut, N, upon the washer, W. This washer being tapering and roughed, and fitting in a corresponding recess in the cap, C, it is firmly bound in its position when the nut is screwed down upon it; and having a hold upon the bolt, B, which passes through and fits the squared hole in its center, the clapper and spring, which are held by the bolt, B, cannot get out of their proper position.

The inventor is G. R. Meneely, of West Troy, N. Y., and a patent was obtained Sept. 7, 1858. Bells mounted in this manner are manufactured and sold at the well-known West Troy Bell Foundry, Andrew Meneely & Sons, agents, who should be addressed for further information.

## PULLEYS ON SHAFTING.

Belting and pulleys form the most simple, universal and convenient method of conveying power to drive machinery, and for varying its speed. It is exceedingly desirable to know how to arrange shafting and set pulleys so as to obtain any number of revolutions required in the machine to be driven, and also to vary the revolutions so as to give one hundred, two hundred, or any number, as may be desirable. Thus, on a large turning-lathe there are several pulleys, called a *cone*, each of a different diameter from the other, secured on the mandrel-shaft, and these are arranged relatively to another set of cone-pulleys, usually called *drums*, on a driver-shaft above. The two gangs of pulleys are of such diameters that the belt which passes over each pair communicates a particular number of revolutions to the mandrel of the lathe. Recently we have received quite a number of communications asking information as to the relative size of pulleys, so as to obtain any number of revolutions wanted. We will give a few rules on this subject, which will meet (as we understand them) the interrogatories of many of correspondents.

1. To find the number of revolutions of the driver-shaft from the diameter of the driver and its revolutions. *Rule*—Multiply the diameter of the driver-pulley by its number of revolutions per minute, and divide the product by the diameter of the driven pulley; the quotient will be the number of revolutions imparted to the latter. *Example*—The driver-pulley is 8 inches in diameter, and makes 100 revolutions per minute; the driven pulley is 5 inches: how many revolutions will it make?—$8\times100\div5=160$ revolutions; or, one and six-tenths, a greater number according to the relative diameters of the two pulleys.

2. The diameter and revolutions of the driver-pulley being given, to find what shall be the diameter of the driven pulley to make any number of revolutions in a given time. *Rule*—Multiply the diameter of the driver by the number of revolutions, and divide the product by the revolutions of the driven; the quotient is the diameter of the driven. *Example*—The diameter of the driver is 12 inches, making 100 revolutions per minute: what shall be the diameter of the driven to make 200 revolutions in the same time? $12\times100\div200=6$ inches in diameter.

3. As it is sometimes necessary to alter driver-pulleys to suit the size of permanent metal pulleys on the lathe, the following is the rule for this operation. *Rule*—Multiply the diameter of the driven pulley by the number of revolutions which you wish it to make in a minute, and divide the product by the revolutions of the driver-shaft, the quotient is the diameter required for the driver-pulley. *Example*—The pulley on the lathe-spindle is 10 inches in diameter, and it is desired to drive it at the rate of 300 revolutions per minute: what must be the diameter of the driver-pulley, its shaft making 100 revolutions per minute? $10\times300\div100=30$ inches.

Each pair of opposite pulleys on a gang must be so arranged that one belt shall drive the whole. The relative speeds of the pulleys being in proportion to their diameters, these must be made to correspond with the length of belt.

In our next number we shall give a description, with an illustration, of the method of constructing and arranging cone-pulleys.

AN OLD PAPER.—The Newport (R. I.) *Mercury*, on the 11th June, commenced its one hundred and second volume. On the 12th of June, 1758, James Franklin (brother of Benjamin) issued the first number, and with the exception of an interval of a few months, the *Mercury* has been regularly served to its patrons, week after week and year after year, whilst all but two of the papers which were then in existence have "gone by the board." We have had the pleasure of seeing the old Franklin press upon which the *Mercury* was first printed. It is now in the office of that journal.

## BATE'S LARD-RENDERING APPARATUS.

The method generally adopted at present for rendering lard is to heat the lard kettles by placing a fire underneath them or by injecting steam into the material itself. The objection to the first method is that it is liable to burn the material, and all the lard and oil cannot therefore be extracted from it; and lard produced by the last mentioned method is liable to have a steam flavor and become quickly rancid. To obviate these difficulties, John J. Bate, of Brooklyn, L. I., has invented and patented his improved lard kettle, the patents being dated Sept. 29, 1857, and July 13, 1858.

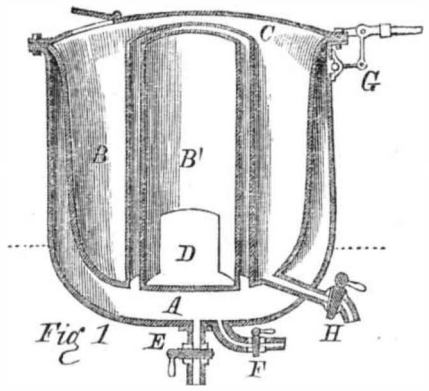
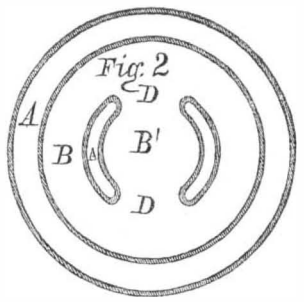



Fig. 1 shows a vertical and Fig. 2 a horizontal section, It consists of a double outer shell or jacket, A, into which steam is admitted from a suitable boiler by a pipe, E; in the interior of A is a space, B, which forms the kettle, and into which the lard is placed. There rises up in B a double-walled cylinder, B', which communicates with the steam space, A, and its space, A, is always also full of steam, so that it heats the lard in the center while the steam-heated surfaces, C and B, heat the exterior portions. Two passages, D D', are made in B',




so that the lard inside the cylinder and that outside in the kettle can communicate and intermingle to distribute the heat and become of equal fluidity. These kettles have been in use, and some of the first lard-renderers speak highly in their praise for the quality of lard they produce, the speed with which they can be worked, and their cleanliness and safety from accident. The lard is drawn off at a faucet, H, and should any steam condense, it can be drawn off at F. G is a safety valve for the steam in the kettle, so that no accident can happen should the steam in the boiler become too highly heated. Further information can be obtained from M. Haskell, No. 103 Fulton-street, New York.

ENGLISH AND FRENCH PATENTS FOR SALE.—Who has not heard of the "Old Dominion" Coffee and Tea-pots, and what good housekeeper on our continent has not the articles in daily use? Among our acquaintances we do not know of one who has not the "Old Dominion," and who would not as soon think of dispensing with his tea-kettle altogether as doing without that desideratum. Messrs. Arthur, Burnham & Gilroy, of Philadelphia, are the manufacturers of the "Old Dominion," and their hands are full of orders. The invention has not to any extent been introduced on the other side of the Atlantic, although the patents were secured there, through the agency of this office, sometime ago. We believe the patents are good and valid in England and France, and that a fortune might be made by the purchaser in either of these countries. See advertisement in another column.

MECHANICS' FAIRS.—We are continuing to receive the circulars of approaching Mechanics' Fairs. We have now before us the rules and regulations of the coming fair of the Maine Charitable Mechanics' Association, which opens on the 1st of September. This fair, we have no doubt, will be one of interest, and should any of our readers desire to consult the rules they may do so on application at our office.

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## A VISIT TO A GUNPOWDER MILL.

On the front of an old-fashioned house in Lombard-street, London, are inscribed the ominous words "Gunpowder Office." Busy as the people are in that busy street, it is remarkable to observe with what apparent care the passers-by choose the opposite side of the way in preference to steering their barks close to so seemingly dangerous a fort. But they need have no fear, for scarcely more than a few ounces of powder, by way of samples for merchants, are ever there.

Gunpowder is the guard-chain and strong-bolt which keeps the barbarian thief from entering the precincts of the peaceful and industrious, and is, indirectly, the great peace-constable of the world. Prior to this clever chemical invention, the wars of sects, classes, or nations were vexatiously prolonged. Charlemagne spent a long reign n perpetual war. During the Roman empire war scarcely ceased, and so it had been with all the preceding inations. The history of the world is a history of shift ing wars. Prior to the invention of gunpowder, or more correctly speaking, prior to its application as a means of warfare, a prolonged peace, such a peace as the 40 years between the Napoleonic wars and the Crimean war, has scarcely been recorded. The fact is that when men discovered the terrible effects of this new engine for their destruction they began to think more seriously of war. The old battles, fought without gunpowder, were not half so much to be dreaded as a modern war. The battles of Ptolemy and Ramises, kings of Egypt, of Nebuchadnezzar, Babylon, and Xerxes, of Susa, were of a class that may be compared to a mighty host of robbers sacking a country with but little or no danger to themselves. What a contrast do such battles present to the terrific encounters at Inkermann and Sevastopol, at which thousands of men were killed after but a few days' contest. All men fear and respect gunpowder. Nations spend millions of money in building fortifications, and in endeavoring to make strongholds impregnable to the effects of this simple mixture, but all their efforts are without avail. No fortress that has ever been erected can hold together against bomb-shells, rockets, und balls flying through space with lightning speed, urged on by gunpowder. The *modus operandi* practiced in the manufacture of an article so destructive cannot fail to interest everybody, and so we ask the reader to accompany us on a visit to the great manufactory at Hounslow.

The tall chimney stacks now in sight are at the Gunpowder Mill; so keep them in view, and you will be sure to travel right. A little walk and you are within hearing of the engine's groans. Now you are fairly within "blowing-up" distance, so have a care; if smoking, put out your cigar. Within a tract of land two miles square is another about half-a-mile broad; and it is within the latter that the mills are at work, ceaselessly, from morning to night, from night to morning, Sunday and week-day without end—until the next terrible explosion gives a little rest, when fresh muscles and new headpieces are quickly again directing this grim work. The first thing that will attract a stranger's attention will be the enormous cords of wood—alderwood and dogwood—for a quarter of a mile: the ominous words "fire-engine," lettered on several, warns one to beware. Now you enter the niter-house, and here all appears harmless enough, boiling and steaming, filtering, cooling, and crystallizing. You will here be pleased enough to see how the dirty earthy saltpeter (niter) of India is washed and purified till it looks as fit to eat as a lemon ice. These large retorts are where the wood is distilled to convert it into charcoal. By this process not only is charcoal produced, but hundreds of gallons of tar, and also acid water. This acid water, in plain truth, is weak vinegar, and has only to be freed by a few strokes of chemical magic from the tarry particles now floating in it to become the white-wine vinegar so tastefully labeled at the great pickle-shops of Soho-square and Piccadilly.

Pass we on. Here the sulphur sold to us by King Bomba, and vomited out from the earth's stomach by the fire-belching mountain Vesuvius, is ground, sifted, and rendered fit to enter the warrior's mixture. The niter, the charcoal, and the sulphur are all pretty harmless in their primitive state, but "when rogues meet, then let honest men beware." So now to the first mill-house. The rumbling, the rattling, the clankling, the screeching, the heaving, the wincing of powerful machinery, overcoming obstacles, are now about as pleasant to hear as an Atlantic steamship fighting against the storm-waves, and you on board of it. An engine-house, boiler, furnace and chimney in the very center of a gunpowder mill! But so it is; one mighty axle passes from the engine-house to six grinding-houses—three on the left, and three on the right. We will enter one of them; it is about the size of a small cottage; on the floor is a monster chemist's mortar, and inside it, in lieu of pestle, there roll two mighty stone wheels, cased with iron tyres, weighing more than 2 tuns each. Forty pounds of mixture—sulphur, niter, and charcoal—are put into the mortar. Over and over this the wheels roll for eight hours before it is considered smooth and fine enough. Every two hours it is "liquored"—that is, a little water is sprinkled over it from the rose of a watering-pot. At the end of eight hours, black-looking demons will appear and carry off this 40 lbs. of meal (it is now called "meal") to the corning-house. Here the meal from all the said grinding-houses is brought together, and subjected to immense hydraulic pressure, so as to form "cakes." Each cake is then cut into slices, and each slice forced through a little sieve-like apparatus, which divides it into "grains." The newly-made grain powder is, however, still too damp for use, and must be dried. To do this the powder is spread out on trays that hold about 10 lbs. each, and is then placed in the drying-house, which is, in fact, another cottage of wood construction. By the side of this building there is a small furnace and boiler for generating steam. This steam passes through convoluted pipes within the drying-house, zig-zag between the racks that support the trays of gunpowder. Proper valves are arranged so as to preven the pipes becoming too hot. Finally the powder has to be made genteel and respectable, with a bright polish on its face, fit to appear into society. This is effected by passing first through the dusting-house. Here all the fair-formed "grains" are sifted away from the "dust;" and so very dangerous is this operation that a large wooden screen is erected all round the house, in order to keep cloud-like dust being wafted by the wind towards any o the boiler furnaces, for the slightest spark falling from the chimney stacks into the dusty cloud would explode the whole. It being thus necessary to keep the dust within a limited space, the men employed in the work are exposed to its noxious influence. Lastly, the powder is carried to the glazing-house. Here it is put into barrels of one hundred lbs. each, together with a few ounces of black lead. Each barrel is fixed on a kind of spit, and made to revolve on its axis until, by mutual abrasion, every grain has the black metallic luster familiar to all who use the "shooting iron." We have said the powder is carried from this house to the other house: now, all these "houses" are but cottages, or rather enclosed wooden sheds, of the lightest possible construction; so built, for obvious reasons, that should any accident occur the whole thing would blow away. The "houses" are separated from each other by many yards, even distant an eighth of a mile. By thus separating the buildings there is, of course, less danger in case of fire.

Through the land on which the Gunpowder Mill is situated there flows a small river—the Colne—and from it are cut several canals, which by serpentine windings form wharves to several of the houses, so that when the powder is sent from one to another it is carried by boats, a means of transit attended with the least danger to those transporting so dangerous a material.

Advantage is taken of the abundance of water-power to do a great deal of the work at the mills; indeed, before the demand for powder became so great, the whole work was put into operation by the motor thus at hand.

Powders of various textures are here produced, which require grinding from six to eight hours for each charge of 40 lbs. Every charge then, as an average, occupies seven hours. The different qualities are known as sporting powder, military or government powder, mining or blasting powder, &c.: 40 lbs. of powder every seven hours is equal to 960 lbs. a week; this multiplied by 10, the number of grinding-houses at work, is equal to 9,600 lbs. a week, 85½ cwt., over (or say) 4¼ tuns weekly, that is 220 tuns annually—220 tuns of gunpowder made yearly at one manufactory.

The source of power in gunpowder lies in the saltpeter; this substance, termed nitrate of potash, consists of nitric acid and potash. Now, the nitric acid is, as it were, an immense volume of atmospheric air, condensed into a solid, ready on demand to assume the air form by the touch of a spark. When sulphur and charcoal are mixed with niter (saltpeter), and a spark is applied, the sulphur ignites, setting fire to the charcoal, and concentrated air is supplied to the substance by the decomposition of the niter. The air condensed therein instantly unites with the combustible, and the result is an intensely hot gaseous compound, two thousand times the bulk of the original solid.

The English government gunpowder is composed of 75 parts of niter, 15 charcoal, and 10 of sulphur. The Russian military powder contains 73¾ of niter, 13½ charcoal, and 12¾ sulphur.

[The above interesting article was sent to us for publication, by our valued contributor Mr. Piesse. On the 30th. of March last, these powder mills were blown up. The explosion occurred within 12 hours after he had left them.—Eds.

## AMERICAN HYDRAULIC CEMENTS.

Not many years ago all the Roman and hydraulic cements used for our public works were imported from England, but at present very little foreign cement is employed, as our engineers consider the American superior in quality for most purposes. One reason for this preference is the freshness of the home product; it can always be procured when newly ground, whereas foreign cement becomes somewhat impaired in its energy by its transport across the ocean, where the atmosphere is very humid. By exposure to a humid atmosphere, hydraulic cement absorbs carbonic acid and moisture, which injure its adhesive and *quick-setting* qualities. Messrs. Delafield & Baxter, Wall-street, this city, who manufacture the famous Rosendale hydraulic cement, inform us that it will keep for a year or more in tight barrels lined with paper, as they put it up, when protected from a moist atmosphere. They have also furnshed us with information in preparing this cement for use, which we know will be useful to many of our readers. As it sets rapidly on exposure and under water, it should only be mixed in such quantities as are required for immediate use; a sufficient quantity of water is employed to make it into a paste of moderate thickness, care being exercised to wet it thoroughly. The sand most suitable for mixing with it should be free from organic and other impurities, and should consist of fine, sharp grains of silica. The use of sand in cement and mortar is to prevent rapid shrinkage, also exposure of the cement on a greater surface; its office is a mechanical, not a chemical one. Experienced engineers in charge of public works usually mix their cement in the proportion of one part of cement to one and a half or two of sand. Others sometimes mix three or four parts of sand to one of cement. All cements (mortars also) should, if possible, be prepared under cover, to prevent their drying too rapidly in warm weather. The stone or brick to be cemented should be free from dirt and well moistened, otherwise they will absorb the moisture from the cement, and prevent the adhesion of its particles during the process of crystallization.

Hydraulic cement is chiefly useful as a mortar for works under water, and for walls of buildings under ground. In making concrete foundations with it, one and a half parts of sand to one of cement should be made up to the consistency of good mortar, and one measure of it to three of broken stones or brick are about the proper proportions that should be used. The whole of the concrete should be laid as rapidly as possible, and finished in sections, well rammed, so as to have the whole work formed into one solid mass, and of an even surface, before it sets, when it should be left undisturbed until it hardens; and if it is exposed in a dry place, it should be moistened occasionally with a little water. Very cold weather is injurious to the energy of cement; in northern latitudes it loses energy during a low temperature, and remains inert until the return of warm weather. Inexperienced persons unacquainted with this fact have condemned the best cements by applying them in the wrong season.

Sounding Shells.—There are few persons who cannot remember the childish wonder with which they were filled, when a sea-shell was first placed to the ear; and the still greater wonder they experienced when told that the strange resonance which they heard was the roar of the sea; this being the common explanation given to children. There are, doubtless, many adults persons who do not know the phenomena of the sounding shell. It is caused by its hollow form and polished surface; these enable it to receive and return the beatings of all the sounds which tremble in the air that surrounds it.

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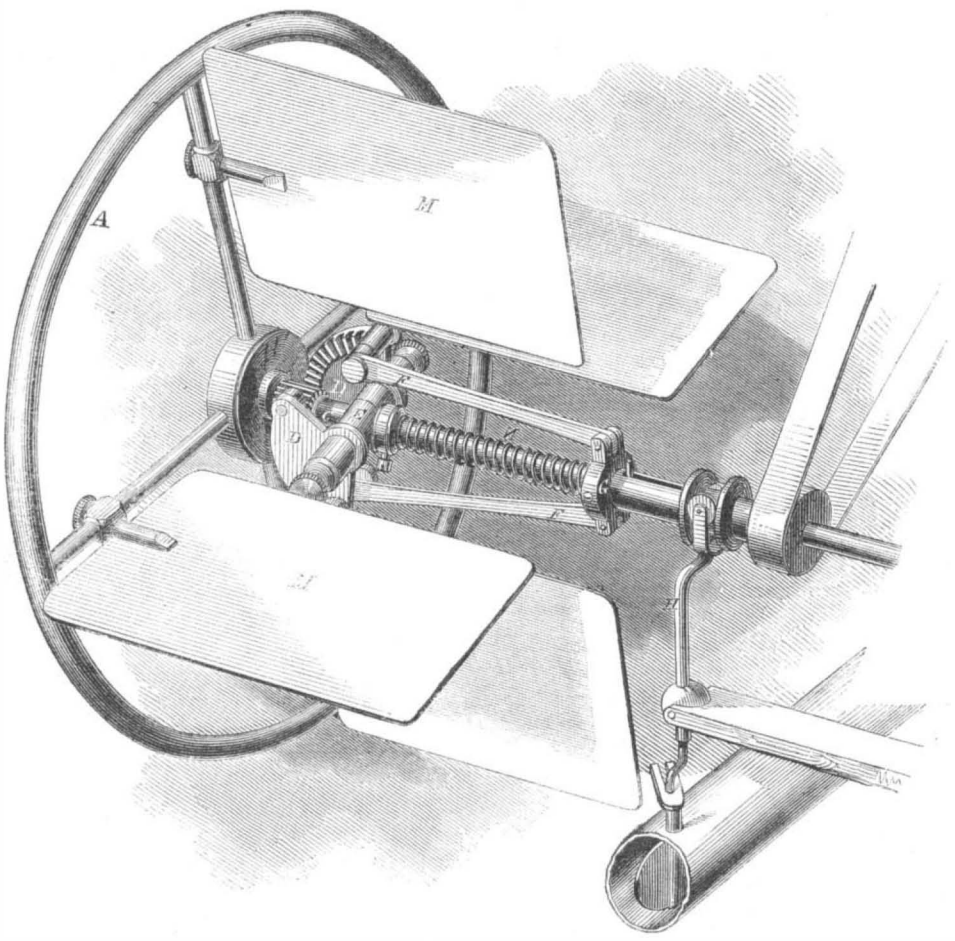
## IMPROVED NAUTICAL REGULATOR.

On page 356, Vol. XI., we gave an illustrative description of a marine governor, invented by Thomas Silver, of Philadelphia, which was first introduced upon the Collins' line of steamers, and subsequently upon various European steamers, including the steamer *Great Eastern*, and the Russian frigate, *General Admiral*, and is finally making its way into the United States navy, a very handsome specimen being attached to the engines of the new sloop-of-war, *Lancaster*, just completed at the Philadelphia Navy Yard. Since the above-named period the patentee has introduced and patented (May 23, 1857) another plan of marine governor, or nautical regulator, as it is called, in which the inertia or regulating nature of a momentum wheel is taken advantage of in the following manner:—




SILVER'S NAUTICAL REGULATOR.

A shaft or spindle, C, which bears the wheel, A, and is allowed to turn loosely in its center, receiving its motion by band and pulley from the main shaft of the engine, and carries with it a cross arm, E, that forms an axis of motion for two sectors, D, with teeth facing each other, and gearing into a pinion which is secured to the center of the momentum wheel, so that, should the spindle be driven by any variation of the speed of the engine at a velocity differing from that which the momentum wheel has attained, the sectors are turned, the one to the right and the other to the left, and as both are linked by arms, F, to a sliding sleeve, G, they work the throttle valve in the ordinary manner. In order to control a relative rotative position of the momentum wheel to that of the spindle, a spiral spring, N, draws the wheel forward by pressing the sliding sleeve from it, whilst vanes, M, which resist the atmosphere, oppose the too rapid speed of the momentum wheel, both the vanes and the spring being adjustable to suit the desired speed of the engine. The speed of a momentum wheel, 25 to 30 inches in diameter and weighing 75 to 100 pounds, thus automatically regulated to rotate 150 to 200 revolutions per minute, exerts a power to work, simultaneously with any variation in the speed of the engine, the largest throttle valves in use.

There are a greater number of engines of comparatively slender construction driving boats on the smooth waters of the rivers of the United States than on all the oceans or waters of the world beside, and yet how rarely do we hear of the breaking of their machinery. The obvious reason is that, in their movements, the resistance to the engine is uniform with the power of steam that drives it, causing an evenness of wear. So the stationary engine, though driving its saws, rollers or millstones, overcomes its intermittent changes of resistances or loads, and works with a smooth and harmless motion; but it is supplied with a governor that regulates the power at all times correspondingly with the ever-varying work is has to perform, and is therefore secure from the evils of an unfair strain. The resistance to the engine of a sea-going steamer is liable to continual variations that are frequently still more abrupt and severe, and which cannot be controlled; hence the necessity of applying the power of the steam commensurate with the ever-varying depth to which the screw-propeller or paddle-wheel may be submerged. To secure this desirable result is the object of a proper marine governor, and the saving of both steam and machinery by the application of such an instrument, as experience has already proved, must reduce considerably the cost of running a steamship.

Since marine governors of a reliable description have become available, scientific journals have repeatedly called the attention of underwriters to this improvement upon marine engines, advising them to charge a greater premium when governors are not used, and suggesting that coercive measures should be used if steamship-owners would not see to their interests in this matter.

For further information, address C. W. Copeland, M. E., 122 Broadway, New York.

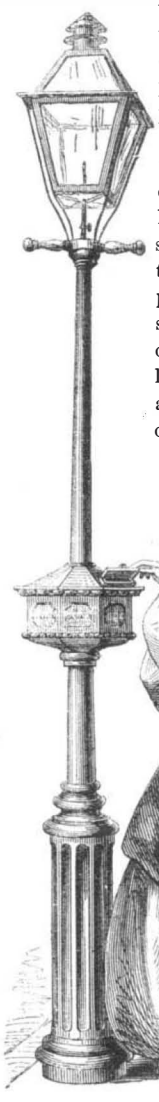
INVENTORS AND PATENTEES will bear in mind that Messrs. MUNN & Co. still continue their successful Agency for procuring Patents in the United States; also in all European countries. They speak advisedly when they say that no other similar Agency in the world does one-half the amount of business, or secures one-half as many patents as their's. Up to the date of the latest issue of the SCIENTIFIC AMERICAN, five hundred and seventy patents have been issued to their clients since the first of January last. This week's list alone contains 32; and thus their business goes on in this progressive and successful manner. Pamphlets and circulars of advice how to procure home and foreign Letters Patent are sent free of charge. Through their Branch Office in Washington, they make examinations into the novelty of inventions for $5.

## THE STREET POST-OFFICE.

When we consider the vast number of persons who comprise what may be called the letter-writing community, we shall at once appreciate the great waste of time which occurs in carrying letters from distant parts of a city, singly or in small bundles, to the central Post-office; and also the inconvenience to the aged and infirm, if they have not any immediate means of conveying their letters. To obviate these inconveniences, therefore (which are apparent, on a moment's reflection, to every one), in most cities a few tin boxes have been scattered in bar-rooms, hotels and public places, where, however much they may help the males of the community, the gentler sex manifestly cannot avail themselves of these advantages.

Pillar boxes have been placed in the streets of London, but the fixing of them was not only expensive, but they are cumbersome and anything save ornamental. The idea has also been suggested that letter-carriers, when they deliver letters, should take what have been written to the Post-office; but this would be a terribly cumbersome business to the letter-carrier. In fact, in all the methods of facilitating the transit of letters, there has been some great practical objection.

We have the pleasure of calling the public attention to an improvement which has been adopted by the Postal Department in Philadelphia, where they have over 300 letter-boxes attached to lamp-posts throughout the city, thus bringing the Post-office to every one's door. These boxes, one of which is shown in the accompanying illustration, are fitted on the lamp-post, and the lid will always close by its own weight to keep wet out, and by a casting inside the drop-hole, the letter, when once dropped in, cannot be seen or extracted until the box is opened by its proper key. There are four collections a day and one on Sundays, so that, by having these placed on the corner lamps in densely populated localities and further apart as the population became more sparse, the people would be saved a great amount of time and the collector's work would be rendered more light, as in collecting from the present tin boxes he often has to mount a flight of stairs, and sometimes to go quite to the back of a long building to the place where the box is fixed. We should like to see this system carried out in every city of the Union, land, in fact, wherever there is popuation enough to maintain a Post-office.



The inventor—Albert Potts, of the northeast corner of Third and Willow-streets, Philadelphia, Pa.—has already received communications on this subject from foreign countries, and we have no doubt that the public will see its great convenience and demand their several postal departments to provide these boxes for their use. The patent is dated March 9, 1858.

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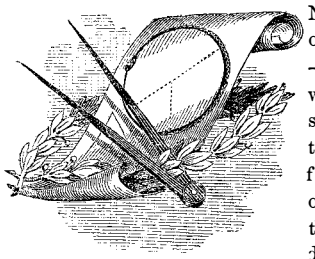
VOL. I., NO. 2.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, JULY 9, 1859.


## THE FATHERS OF PHILOSOPHY.—II.



NE lash of the whip, one plunge of the spur —or better, one kind word — is enough to start the willing steed to action, and to give free vent to that glorious motion which, to the accomplished rider, produces in him that centaur-like feeling, and is the hight of his joy. So was it with Greece. No sooner had Thales set the example, than physical investigation and subtle reasoning seemed to be the very thing that the Grecian mind had been wanting, and philosophy really became "the rage." Followers quickly gathered around the old philosopher or embraced his doctrines, and many of these Ionic thinkers became truly famous, the immediate successors of Thales, in chronological order, being

### ANAXIMANDER AND ANAXIMENES.

They were both fellow-townsmen of Thales, being born in Miletus, the former in 610 B. C. and the latter in 556 B. C., or thereabouts, for we are not positive as to their exact birth-place or date. It has been inferred that Anaximander was at one time an instructor of youth, for there is an anecdote recorded of him which would lead us to make such a conjecture. Being laughed at for singing or reciting his verses ill, he said, "We must do better for the sake of the boys." This idea is strengthened by the fact that he was the first who taught philosophy in a public school; Thales having been satisfied to enunciate his discoveries and doctrines to a select and appreciative few. He made a connected series of geometrical truths, and was the first who marked out the surface of the earth and divided the land and water on an artificial globe. But grander than all and greater than all, was his appreciation and application of Cadmus' invention, the art of writing, for he laid aside the defective method of oral tradition and committed the principles of natural science to writing. It has been asserted that he invented the sun-dial, but we think that Herodotus was right in assigning it to the Babylonians, although he may have used a gnomon to verify Thales' observations.

An old encyclopedia which we have consulted, says: "It is related of him that he predicted an earthquake; but we need not say that, as this is impossible, the relation must be fabulous." Now we know that many earthquakes and volcanoes are periodic, and therefore if Anaximander knew, from observation or tradition, this fact, it would not be quite so impossible as our authority imagines. The principles that he taught were, that all things came from infinity, and terminate in it, and that the universe, though changeable in its parts, is immutable as a whole. He believed the stars to be gods, or inhabited and animated by portions of divinity. The sun he stated to be twenty-eight times larger than the earth, which was not *quite* true, as the sun is thirteen hundred thousand times greater in bulk than our little planet. This great man, who had done much to introduce method into the philosophy of his day, and who had originated many ideas, died at the age of sixty-four, leaving behind him a sect or body of followers who have been called Anaximandrians.

The Anaximenes who interests us, it must be recollected, is not the Greek rhetorician and historian who was the instructor of Alexander the Great, and who wrote the life of that great conqueror and his father, Philip of Macedon; but ours is the one who expounded more fully than Thales had done his philosophical doctrines to the young and old of Greece. The astronomy which he taught sounds odd in our ears, but when we recollect that the telescope was unknown, and all their observations with the naked eye were colored and refracted by and through a superstitious medium, we shall be surprised at the boldness of his surmises. We can imagine him standing on the steps of some classic temple, or sitting in some quiet grove with an admiring class around him, his splendid eye and finely-chiseled features lighted with enthusiasm, as he, extending forth his right arm through the folds of his ample robe, exclaims, "See you yon crystal plane in which the fiery stars are ever and immovably fixed, in which the round sun and moon burn their perpetual fires, and the earth, like a plane tablet, rests on the buoyant air? The ether that supports us, makes us; for mind, which is the essence of all things, is ether, and all the phenomena of nature, fire, earth and water, proceed from it or are made by it, by rarefaction and condensation!" This was his teaching, and we have imagined it to be his speech, by which he did not give much impetus to discovery, but rather devoted his life to enforcing what was already known and believed. The date of his death is uncertain, but some think he lived to a good old age.

## PHOTOGRAPHY AND THE ARTS.

When Daguerre made the discovery of transferring the likenesses of living beings to tablets of metal by a pencil of sunlight, it was justly hailed as one of the most extraordinary inventions ever developed. At first, and for several years afterwards, this art was confined to obtaining pictures of persons, but it was at last delivered from this limited circle of application. The employment of prepared paper (the invention of Fox Talbot) for taking pictures by the solar beam, was found to be a great improvement. The paper being more flexible in its nature than the metal plate, the artist soon learned to range the woodland and the wild with his portable apparatus, and take pictures of rural scenery as well as those of persons. By this art he is now enabled to carry home with him the indelible print of the glassy lake which he saw sleeping beneath the noontide sun, a copy of the ivy-clad cottage on the bank of the river, and pictures of the green fields and forests through which he roamed.

One of the most recent and useful applications of this art is that of obtaining copies for lithographic printing. Owing to the vast number of banks in our country, and the great variety of their notes in circulation, an extraordinary amount of temptation is presented to the forger; counterfeit bills, therefore, of all denominations, are continually appearing; and although their authors are detected in one place, they seem, like the dragons' teeth of ancient story, to be continually bringing forth a fresh crop in some other form. Photography has been applied to furnish a key for detecting these fraudulent bills. A new weekly periodical, published by Wm. Cousland & Co., Nassau-street, this city, contains several plates of such bills, and it is therefore a mirror whereby they may be examined. The counterfeit bills are copied by photography on prepared stones, and from these lithographic prints of the bills are obtained at a comparatively low cost. Of the utility of such a weekly periodical there can be no question, as its first number has *fac-similes* of the bills of no fewer than one hundred and forty-four banks in Massachusetts alone. When this is the case, how great must be the number of counterfeit notes on all the banks in the country, now in circulation!

Another recent and useful application of this art is that of taking copies of machines, in whole or in parts, Some of our tool and machine manufacturers take photographic views of every machine which they make; these not only serve as records of their products, but the pictures are sent to persons who wish to order similar machines, so as to give them a clear idea of the article which they may wish to purchase. Several machine-shops, like that of Messrs. Hoe & Co., in this city, have a photographic gallery connected with their drafting department; and we recently examined some pictures taken at Mr. Sellers' celebrated tool manufactory in Philadelphia, which were really photographic gems. They resembled shaded drawings of a high order, and conveyed an excellent idea of the form and construction of the tools represented.

We have lately examined another new and useful application of photography, namely, that of copying works of art, such as silver-ware and other like manufactures. Thus, Messrs. J. A. & F. Dunworth, No. 395 Broadway, manufacturers of silver-plated ware, have a photographic gallery connected with their rooms, for copying their designs, which can be sent to any part of the country, so that a true idea may be obtained of the form of any article which they manufacture; the copy can be transmitted a thousand miles in a letter, and a purchase made from the picture almost as safely and satisfactorily as from seeing the article itself.

As we have, in former numbers, described the application of photography to engraving, we need not further allude to this at present. We have recently heard that it is now applied by the designers of new patterns for calico-printers to multiply copies at a small expense. The new design is copied by photography, which gives all the lights and shadows of the pattern, and it only requires to be colored afterwards. Formerly copies were only obtained by drawing the whole pattern by hand, which was a tedious method in comparison with sunlight drafting.

The field for new applications of this useful and beautiful art is still extensive. The facts which we have set forth will no doubt suggest to others new adaptations of it, each of equal importance to any which have yet been successfully prosecuted.

## " VERY ILL."

We are sorry for you and you have our sympathy, no matter when or where any of you may have occasion to use the above expression, and to prove that we do pity all who may be laid on a bed of sickness we will give a few common-sense hints how to hasten recovery. The first grand requisite is patience, a quiet and calm endurance of suffering, and a resignation to the temporary loss of health. Then comes cheerfulness, not of the sick alone, but of all around; a cheerful countenance smiling over the sick bed can do more good than gallons of physic. The mind of the invalid should be kept diverted from the ailment, and funny, interesting matter should be read aloud for some time every day. The sick room should be kept a pattern of cleanliness. It should be well ventilated, cool and light, and lastly, the doctor should be chosen for his jollity and good humor as much as for his scientific attainments; and, we had nearly forgotten to mention it, never put a sick person in a curtained bed; let them, no matter what the ailment be, have plenty of the free life-giving air, and if the light be too strong a white shade can be hung before the window, but put none around the bed. A person who is sick should always, if possible, sleep alone, and as light a covering as is consistent with warmth is the best. By following these rules and taking your potions at the proper times, as ordered by the doctor, should any of you still continue ill, but able to be about, we recommend that you set out on a canvassing tour in your neighborhood to procure subscribers for the SCIENTIFIC AMERICAN. The exercise, with the satisfaction that you are doing good, will restore you to perfect health. Try it.

REPOSITORY OF THE ARTS AND SCIENCES.—The Editors and Publishers of the SCIENTIFIC AMERICAN desire to make their journal in every sense a complete repository of useful information, and to this end they earnestly solicit information from the Workshop, the Manufactory, the Laboratory, the Farm, and from all other sources likely to afford interest to an inquiring, thinking, intelligent class of readers. The SCIENTIFIC AMERICAN is, *par excellence*, the journal of the Inventor, Mechanic, Manufacturer, and Man-of-science; they have, therefore, a right to be heard through its columns, and are cordially invited to send in their contributions. We hope they will send us, from time to time, accounts of their discoveries; and such other items of interest as are occurring in their respective locations and in keeping with the character of this journal.

STEAM-PLOWING.—The steam plow of Mr. J. Fawkes, of Lancaster, Pa., which lately met with an accident at Philadelphia, as recorded in a former number, will be repaired in due season, as we have been informed, and exhibited at the Illinois State Fair, to be held in the month of September next.

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## THE PROGRESS OF INVENTION.

As week by week rolls away, making up the months and years, and carrying with all its developments the grand cycle of eternity, that immortal thing, the human mind, is ever active; and even in the short space of seven days, new ideas of vast value to the world are being embodied into the practical form of inventions, and live to lighten the world in which they are produced. As is our custom, let us, as eclectics, pick from the list of claims of Patents issued from the United States Patent Office last week, and printed on other pages of this paper, some inventions that deserve a more extended notice.

We find that W. & R. Skene, of Louisville, Ky., have patented two valuable inventions. One of these is for a progressive power-pulley press, which consists in arranging a scroll with a conical right and left-hand screw windlass, in such relation to the follower of a press, that a weight attached to a rope which running over the scroll, acts by means of ropes running from one, follows over a series of pulleys to the other follower, and to the conical windlasses, with continually increasing power, so that a substance placed between the two followers of the press is subjected to a long continuing and ever-increasing pressure; and the scroll, together with the conical windlasses are arranged on a shaft, which has bearings on slides attached to the upper follower, so that the weight of those parts assists in doing the work. The other is for an improved progressive power-gear press, and it consists in arranging a windlass, and a scroll or pulley in combination with a series of gear-wheels and pinions, and with a rack-tooth on both sides in such a manner that, by means of a weight suspended from a rope which extends from the windlass to the scroll, or progressive power is exerted on a follower that is attached to the lower-end of the rack, so that a substance placed between the follower and press-bottom is, as in the former case, exposed to a continual increasing pressure during the period of time that the press is in action. These inventions have by means of gearing and pulleys attained the same end, namely, a good press; and either of the systems can be placed in use, according to the will of the purchaser,

A. Dickinson, of Claremont, N. H., has invented an improvement in washers and purifiers of gas, the object of which is to bring the gas into a more intimate and diffused contact with the water used for washing and purifying it than is done in the washers, or water-purifiers hitherto employed.

James Harrison, Jr., of New York, has improved the machinery for making upholsterer's coiled-springs. The invention relates to machinery, for which he obtained a patent, January 27th, 1857, and consists in a novel mode of applying and operating one or more of the forming-rollers by whose aid the wire is coiled upon the mandrel, whereby the coiling of the wire is effected in a better manner, and a spring of superior quality is produced.

The braiding of whip-lashes and similar articles has long been performed by hand, and it has been thought by many that machinery could never accomplish that seemingly intricate combination of cords, but by an arrangement of shuttles and moving shuttle-boxes, all acting in unison by gearing, and at the proper time (invented by Isaac W. Lamb, of West Novi, Mich.), machinery has stepped in and carried the business, as it always does, from slow hand-work, and has made it an ordinary mechanical process.

H. S. North & J. O. Couch, of Middletown, Conn., have patented a new fire-arm, which they call a "Game Shooter." The invention consists in a fire-arm of novel construction with several barrels or chambers, which are so combined as to be fired from a single vent; and whose lock is so constructed and applied as to permit the attachment of a bait in such a manner that any animal seizing and attempting to carry off the bait will produce the discharge of the piece in such a direction to shoot it. The same piece being provided with a stock may also be used as a pistol or common fire-arm.

American horse-shoe machinery has now obtained a lasting name the wide world over, but this seems scarcely to satisfy the restless inventor; he must invent and improve or he is not happy: and following out this idea H. L. Watts, of Huntington, Mass., has produced from the recesses of his fertile brain, another horse-shoe machine, the invention in which consists in a certain mode of applying and operating a die for forming the interiors of horse-shoes, in combination with side followers and rollers for forming the exterior of the shoes.

And thus we finish our few notices, but many other equally ingenious ones will be found under the claims themselves.

## VARIETY IN CREATION.

There are 36,000 species of plants exhibited in the Museum of Natural History in Paris. The whole number of species in earth and sea cannot be less than four or five hundred thousand. These are of all sizes, from the invisible forests in a bit of mouldiness, to the towering trees of Malabar, fifty feet in circumference, and the banyans whose shoots cover a circumference of five acres. Each of these has a complicated system of vessels for the circulation of its juices. Some trees have leaves narrow and short; others—as the taliport of Ceylon—have leaves so large that one of them can shelter fifteen or twenty men. Some exuviate their leaves annually, as a whole robe, leaving the tree nude, its bare stem towering aloft and its branches spreading themselves uncovered in the sky; while the leaves of others drop off one by one, new ones constantly growing in place of the dismembered ones, and the tree retaining its perpetual verdure. There have actually been ascertained, in the animal kingdom, about 60,000 species of living creatures. There are 600 species of mammalia—those that suckle their young—the most of which are quadrupeds. Of birds there 4,000 species; of fishes, 3,000; of reptiles, 700; and of insects 44,000 species. Besides these there are 3,000 species of shell-fish, and not less than eighty or one hundred thousand species of animalculæ invisible to the naked eye!

[We clip the above from an exchange and we expect that for species *genera* should be read, as the specific difference between the lower forms of life is so slight that species seem to multiply indefinitely.—EDS.

## Proverbial Bricklaying.

Long before books were known, information was spread among the people by pithy sentences or rhymes. We find the following to have been in common use in England in the Middle Ages, and, with the exception of the first, they still hold good:—

"Consult the stars and rule the planets well, before you build a house or sink a well."

"A castle wall, to be stout, must be full of mortar and grout."

"Bricks are never well set unless they are first well wet."

"If you would make a wall stand, use good lime and clean sand."

PRESERVE YOUR NUMBERS.—We often hear persons who have taken the SCIENTIFIC AMERICAN for the last dozen years, and preserved all the numbers since they commenced it, lamenting that they cannot procure the earlier volumes so that they may have the work complete. A few years hence there will be many who will regret they had not preserved the early numbers of the *new series;* and that we may fulfil our whole duty to our patrons in this respect, we give them this early warning in regard to the first numbers of this volume. If the reader does not wish the numbers to bind for himself, undoubtedly, before the present year closes, the numbers can be sold at an advance above the cost, while he will have the benefit of a weekly perusal of the numbers which will cost him nothing. Again we counsel all to preserve their numbers.

CONDITION OF THE PATENT OFFICE.—The Patent Office is getting along very tardily in some of its departments; indeed, so much so, that it begins to disappoint the expectations of many inventors. If "hope deferred maketh the heart sick," surely there are many inventors just now who are suffering the pangs of this disease. If the examining force of the office is too small it ought to be increased with as little delay as practicable, as nothing can be done to retard its business and popularity so effectively as this "dull delay." Commissioner Bishop, we have no doubt, will look into this matter, and provide the needed remedy.

A BRICK MACHINE introduced into Russia by Mr. Clayton, of London, Eng., is capable, it is said, of producing ten millions of bricks per annum. He has got some special privileges from the Russian government, and is now establishing large works in that country.

## AN ATLAS.

The value of an atlas to every person who reads or thinks is immense; it is to him as though the whole world were done up in book-form for his special gratification, and should the mind take a discursive turn he can, upon opening its leaves, wander without money, passport, let, or hindrance over continents, islands, and peninsulas. But an atlas which is incorrect is worse than none at all, and in choosing one the purchaser should be careful that it is correct not only in the position of places, but in the minutest detail of a mountain, or the bending of a river; an error of an inch on paper is often many miles on the actual ground. The best atlas that we have seen, and the one which is most highly recommended for its accuracy by the first physical geographers of this continent (among whom we may enumerate Prof. Guyot, Dr. Hawkes and Prof. Bache) is "Colton's Atlas of the World." The maps are finely drawn and engraved, and the coloring is suitable and distinct, while towns and villages, of which we have never before heard, appear there, almost "as large as life." Such a work is a far more sensible table decoration than a dozen "books of beauty" and fantastic literature, as no one with eyes that can be used can look into an atlas five minutes, without learning something which he did not know before. All who can afford it should possess an atlas, and that atlas should be Colton's. Published by J. H. COLTON & Co., New York City.

THE TICINO.—The Ticino, which has lately become the object of so much interest from the great struggle which s taking place in its vicfnity, takes its rise in the Swiss Alps, at the foot of Mount St. Gothar, flows southward, crosses Lago (lake) Maggiore, and, separating the Sardinian States from Venetian Lombardy, falls into the river Po, near Padua. It is navigable for a distance of one hundred and seventy-three miles. On its banks Hannibal gained his first victories in Italy. Here he defeated Scipio in the year 218 B.C., and on the 31st of May 1605, the French and Austrians fought a battle on this river.

POST-OFFICE PATENTS.—"The absurd story that the General Post-office Department was losing a million of dollars per annum from the use of counterfeited postage stamps has awakened a lively interest on the part of inventors to secure the government against such frauds. The Department is in receipt of numerous offers of patent contrivances, each very simple and, in the opinion of the inventor, infallible to prevent such abuses." So says an exchange, which illustrates the fact that the truest patriots in our land are those self-same inventors with their "patent contrivances."

ATMOSPHERIC WAVES.—The movements in our atmosphere producing the phenomena thus designated have recently received much attention. On certain days the barometer rises as if the thickness of that stratum of air pressing on our heads had been increased, and at others the glass falls. This action is propagated to adjacent regions. Father Secchi has ascertained that these motions are communicated from Rome to London in about thirty-six hours.

EXPENSIVE TUNNELING.—The expense incurred up to the present time for the tunnel under the Alps, amounts to $1,000,000 for a length of 613 metres (2,000 feet) which have been pierced. The cost of the tunnel-heading (full width and hight) up to the present time, is about $600 a yard—an expensive operation.

THE mammoth newspaper, the *Constellation*, published by G. Roberts, of New York, commemorative of the Fourth of July, is the largest sheet, we believe, which has ever been printed. It is 70 by 100 inches, or over eight feet long and six broad; and is full of illustrations and excellent accompanying articles. The whole story of the "Moon Hoax" is here re-produced, and is of itself more than worth the price, fifty cents.

RATHER TOUGH.—It is reported that Mr. Perry Rigly, formerly a citizen of Macon, Georgia, has lately been garroted in the city of Havana, on a charge of carelessness or negligence in running a train, of which he was the engineer, by which a "run-off" occurred and several persons lost their lives.

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## FOREIGN SUMMARY—METALS AND MARKETS.

The West India Royal Mail Steamship Company has a fleet of twenty steamships, the capacity of which amounts to 44,058 tuns; with engines of 10,630 horse-power in the aggregate. They are also building two new iron-steamers of 3,092 tuns burden each, and said to be as large as the *Persia*, which is the premier vessel of the Cunard line.

Quite a number of the British steamers are now using super-heated steam (steam heated apart from the water in the boiler), and with an economy, it is said, of about 33 per cent. in fuel. The Peninsular & Oriental Company had applied it to one of their steamships, the *Valetta*, the engines of which were furnished by Messrs. Penn & Son, of London, and the results were so favorable that it is expected their whole large and powerful fleet will be supplied with similar apparatus.

An experiment was lately made at one of the iron-works at South Wales, for testing the effects of hydrogen gas in the pudding-furnace for removing impurities from the iron. This gas was generated from water by decomposing zinc in it, and it was admitted in small streams among the metal in the furnace. It is stated that the iron produced was of a superior quality, and the results obtained were secured in about one-half the time required by the ordinary process. Hydrogen gas has been employed for purifying iron in the laboratory, but it has not been applied prior to this on a large scale, because it was thought too expensive.

A steel steamer, called the *Windsor Castle*, one hundred and ninety feet long, twenty feet broad, and seven feet depth of hold, has been built by Messrs. Caird, of Greenock, Scotland, and it is so light that it only draws three feet of water. The hull, boiler, paddle-wheels, and considerable portions of the engines are all made of steel. She has run at the rate of twenty statute miles per hour. This is certainly a curiosity of a steamer. Her two engines have cylinders of forty inches in diameter, stroke sixty inches, and the steam is cut off at twelve inches. The wheels have feathering-paddles; the boiler is a tubular upright, and the steam used is super-heated.

Quite a controversy has been going on in the London *Engineer*, between H. Hyde and several anonymous correspondents in regard to the merits of the Hughes Telegraph, and the other kinds now in use in England. Mr. Hyde is the champion of the former, and he dares all those who oppose him to a practical test of the several telegraphs. It seems that Mr. Hughes has experienced much opposition to the fair testing of this telegraph by those who have patents on the instruments that are now in use.

### PRICES OF FOREIGN METALS, JUNE 17.

| | £ s. d. | | £ s. d. |
|---|---|---|---|
| Staff. bar-iron, per tun.. | 8 00 00 | Swedish steel, in faggot | 21 00 00 |
| Single sheet..... | 9 10 00 | Copper in tile..... | 107 10 00 |
| Double sheet..... | 11 00 00 | British pig lead..... | 22 15 00 |
| Round nail rod..... | 8 00 00 | Tin, block..... | 129 00 00 |
| Square nail rod..... | 9 00 00 | Bar..... | 130 00 00 |
| Hoop iron..... | 9 00 00 | Banca,..... | 134 00 00 |
| Welsh iron rails..... | 5 15 00 | (Charcoal) plates..... | 13 00 00 |
| Staffordshire pig-iron... | 3 10 00 | Spelter..... | 19 00 00 |
| Scotch pig-iron ..... | 2 11 00 | Zinc, in sheets..... | 28 10 00 |
| Swedish iron..... | 13 00 00 | Copper sheathing, per lb | 00 1 00 |
| Swedish steel..... | 20 10 00 | Brass sheathing..... | 00 00 10 |

The prices are about the same as last week. There has been a very limited demand for Scotch pig-iron, in comparison with that experienced at the same season last year.

American common resin was selling at four shillings per barrel.

For these commercial statistics we are indebted to the London *Engineer* and *Mechanics' Magazine*.

### New York Markets.

COAL.—Liverpool cannel, $8 96 per tun; Newcastle gas, $7 25, delivered at the gas-works; Anthracite, from $4 50, $4 75, to $5.

COTTON.—The market has been quiet, with a fall of one-fourth of a cent from last week's prices. Good ordinary Upland, Florida and Mobile, 10¼c.; Texas, 10½c. There is not much disposition to buy or sell.

COPPER.—Lake Superior ingots at 21c. per lb. for cash. Copper bolts, 30c. A slight fall from last week.

HEMP.—In St. Louis—our American hemp depot—the prices have been ranging from $95 to $103 per tun for lower qualities. Some choice brands have been sold for $160.

IRON.—American rails, $51 50; bars, $60; same as last week, with very moderate sales. Anthracite pig at $21, $22 and $23 per tun, according to the brands.

LEAD.—Pig is quiet, and we have only to note sales of 1,000 pigs Galena at $5 70; 55 tuns Spanish, $5 62½, cash, and $5 70, four months interest; and 100 tuns refined German, $5 62½, cash.

LEATHER.—Oak tanned sole, light, 31c. a 34c. per lb.; Philadelphia and Baltimore (made from slaughtered hides), 32c. a 35c.; Hemlock, tanned, 23c. a 25c.; Oak tanned dry hides, 26c. a 45c.; Hemlock tanned dry hides, 22½c. a 30c.; Upper leather calf-skins, 58c. a 65c.; Hemlock, 42c. a 65c. Hemlock sole continues at good request, and with a moderate stock, prices are maintained. The demand for Oak sole continues to exceed the supply, and prices are without change. Enameled, light, 16c. per foot; Enameled, heavy, 17c.; Sheepskins, 25c. a 28c. per lb.; English sumac sheepskins, 20c. a 22c.

LUMBER.—Eastern pine and spruce at $12 and $15 per M., according to qualities.

NAILS.—Cut are quiet but steady at 3½c. a 3¾c. per lb. American clinch sell in lots, as wanted, at 5c. a 6c. (according to the kind, &c.), six months.

RESIN.—Brown (for Liverpool), 3,600 bbls., at $1 82½ per bbl. of 310 lbs.; white, $2 50 a $4; very pale, $5 50 per bbl. of 280 lbs.

SPELTER.—Silesian, at 5 3-16 cents per lb.

TIN.—Plates are in ample stock. The transactions are comparatively limited, though they have been larger than for some time past. The sales are 2,000 boxes ½d X supposed $9 37½ a $9 50; 300 I. C. Coke, $7 31¼; 1,000 Charcoal Terne, a shade under $8 50, six months; and 300 I. C. Charcoal, on private terms. Block is dull. Banca at 31½c., cash. English, 29½c.

TURPENTINE from 45c. to 46c. per gallon in large lots, and 47½ in small lots.

ZINC at 7½c. a 7¾c. per lb.; the latter price being from stores.

The foregoing rates indicate the state of the New York markets up to June 29.

### LUMBER PRICES AT ALBANY.

The Albany Lumber Market is, next to Chicago, the greatest in our country, and the prices ruling in that city, together with the supply on hand, are of interest to a large portion of our citizens. The assortment on hand is very good at present, the demand is moderate, and the receipts are the same.

The receipts for the week ending June 29 were boards and scantling 8,567,000 feet; shingles, 955 M.; staves, 2,799,700 lbs.

The following is a list of the prices:—

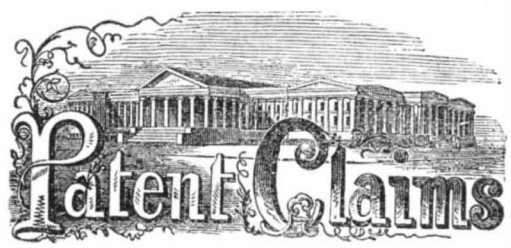
| | | | |
|---|---|---|---|
| Pine, clear, per M..... | $33 00 | a | $35 00 |
| Pine, 4th quality..... | 23 00 | a | 25 00 |
| Pine, select box..... | 19 00 | a | 21 00 |
| Pine, Chemung box..... | 16 00 | a | 17 00 |
| Pine, box..... | 13 00 | a | 15 00 |
| Pine, clear, ⅝..... | 27 00 | a | 29 00 |
| Pine, 4th quality, ⅝..... | 20 00 | a | 22 00 |
| Pine, select, ⅝..... | 17 00 | a | 19 00 |
| Pine, box, ⅝..... | 10 00 | a | 12 00 |
| Pine floor plank, good, 1¼ inch, each..... | 00 23 | a | 00 27 |
| Pine floor plank, 2d quality..... | 00 19 | a | 00 22 |
| Pine floor plank, culls..... | 00 11 | a | 00 15 |
| Spruce boards..... | 00 11 | a | 00 12½ |
| Spruce floor plank..... | 00 14 | a | 00 15 |
| Spruce plank, 2 inch, good..... | 00 20 | a | 00 21 |
| Pine tally boards, good..... | 00 16 | a | 00 18 |
| Pine tally boards, 2d quality..... | 00 12 | a | 00 15 |
| Pine tally boards, culls..... | 00 8 | a | 00 11 |
| Hemlock boards..... | 00 9½ | a | 00 10½ |
| Hemlock joist, 3 by 4..... | 00 10½ | a | 00 11 |
| Hemlock joist, 4 by 6..... | 00 21 | a | 00 22 |
| Hemlock wall strips, 2 by 4..... | 00 7½ | a | 00 8 |
| Clap boards, pine, clear, per M..... | 20 00 | a | 00 00 |
| Clap boards, pine, 2d quality..... | 15 00 | a | 17 00 |
| Ash, good..... | 25 00 | a | 28 00 |
| Ash, 2d rate..... | 15 00 | a | 18 00 |
| Oak..... | 25 00 | a | 28 00 |
| Maple joists..... | 16 00 | a | 17 00 |
| Black walnut, good..... | 40 00 | a | 45 00 |
| Black walnut, 2d quality..... | 25 00 | a | 28 00 |
| Black walnut, ⅝-inch..... | 35 00 | a | 40 00 |
| Sycamore, 1-inch..... | 25 00 | a | 00 00 |
| Sycamore, ⅝-inch..... | 20 00 | a | 00 00 |
| Cherry, good..... | 40 00 | a | 45 00 |
| Cherry, 2d rate..... | 20 00 | a | 30 00 |
| White wood chair plank..... | 38 00 | a | 40 00 |
| White wood chair plank, 1-inch..... | 21 00 | a | 24 00 |
| White wood chair plank, ⅝-inch..... | 15 00 | a | 17 00 |
| Shingles, 1st quality, shaved, pine..... | 5 00 | a | 5 50 |
| Shingles, 2d quality, shaved, pine..... | 4 00 | a | 4 50 |
| Shingles, common, shaved, pine..... | 2 00 | a | 3 00 |
| Shingles, 1st quality, sawed, pine..... | 0 00 | a | 3 50 |
| Shingles, 2d quality, sawed, pine..... | 2 75 | a | 3 00 |
| Shingles, common, sawed, pine..... | 2 00 | a | 2 50 |
| Shingles, sawed, hemlock..... | 2 00 | a | 2 25 |

The sum of $3,820,000 was paid in this city on the 1st inst. as interest on the State and city debts for the previous six months, and $1,373,000 were also paid as city bank dividends.

SHINGLES.—The steamer *Michigan* took on Wednesday, June 22, from Newbury & Goodell, of Green Bay, Wis., 315,000 shingles, shipped to that place from Oshkosh, for Albany, besides 69,000 from other parties for Michigan. The 315,000 are part of a contract for 2,000,000, from Oshkosh to Albany, to be filled the present season. It is said that Northern Wisconsin is able to supply the Milwaukee and Chicago markets with lumber and shingles.

FROM THE UPPER LAKES.—The schooner *Indus*, Captain Humphreys, from Milwaukee, via the Welland Canal and St. Lawrence River, arrived here a few days since. The *Indus* is the first vessel which ever arrived here from the Upper Lakes. She is 250 tuns register, and has a cargo of lumber. Her captain speaks rather unsatisfactory of the way the transit from the canals into the St. Lawrence is conducted, and it is not supposed that our friends on the lakes will find ocean navigation profitable at all.

THE VALUE OF BERRIES—Ocean county, N. J., has long been celebrated for the quantity and quality of her huckleberries and cranberries, and hundreds of thousands of bushels are annually sent to market. The profit on the crop on good land, is from $ 100 to $ 150 per acre, and the appearance of both, at the present time, is said to be very promising. Over two hundred thousand baskets of strawberries were received in this city, in a single day, brought by the Erie Railroad. This business in its season is an enormous one, and helps to afford subsistence to many a "licensed vender" and poor berry girl.




ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING JUNE 28, 1859.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

**24,528.—J. N. Allen, of Providence, R. I., for an Improvement in Constructing Rims and Field-pieces for Watch and Locket Cases:**

I claim making the rim and field-piece for watch or locket cases from a strip of sheet metal, substantially as described.

**24,529.—C. M. Alexander, of New Albany, Ind., for an Improvement in Vapor Lamp Burners:**

I claim the combination of a retort having converging sides, and constructed substantially in the manner set forth, with an inlet-pipe, and outlet-pipe, and a burner for the purpose of forming a gas generating apparatus, to be used in connection with fluid lamps, as is fully described.

**24,530.—J. C. Bean, of Grayville, Ill., for an Improvement in Seeding Machines:**

I claim the arrangement of the hopper, c, and arms, i i', in combination with the inclined equalizer, h, the whole being constructed substantially as and for the purposes set forth.

**24,531.—Wm. Beaumont, of Paterson, N. J., for an Improvement in Gas Retorts:**

I claim making all that part of a retort which is most subject to expansion and contraction, corrugated to prevent fracture, as described.

**24,532.—Edw. Beck, of Allentown, Pa., for an Improved Contrivance by which the Workman operates Scroll Saws:**

I claim the oscillating platform, L, connected with the shaft, C, by means of the straps, h h, and pulley, D, or their equivalents, the arm, E, pitman, F, and spring, I, arranged for joint operation, substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of sawing-machines which are designed for sawing small work, such as scrolls and curved articles, and are generally known as jig and muley saws. The invention consists in the peculiar means employed for operating the saw, whereby the operator may drive the saw, and at the same time have perfect control over the work, so that it may be readily manipulated and properly presented by him to the saw.]

**24,533.—Henry Betts, of Hamilton, C. W., for an Improvement in Railroad Bars or Rails:**

I claim the angle rail, in combination with the outside bar, where the space between them is filled in with cement, prepared by boiling sand and coal tar, in such proportions as will best resist the action of the elements, cold, heat, and moisture, and the wear of the wheels.

**24,534.—M. B. Bigelow and Anson Hardy, of Boston, Mass., for an Improved Fireproof Desk:**

We claim the movable table, d, or any device essentially the same, in combination with the fire-proof case, a a a, said table being constructed and made so as to operate in the manner substantially as and for the purposes specified.

We also claim the slide, f, or any device essentially the same, in combination with the movable table, d, and the fireproof case, a a a, for supporting or assisting to support said movable table, whenever said table is drawn out to the position shown in Fig. 2, said slide and table being connected and made so as to operate in the manner and for the purpose substantially as specified and shown.

We also claim the brackets, q q, or any device substantially the same, in combination with the fireproof case, a a a, for supporting or assisting to support the movable table, d, and the slide, f, in the manner and for the purpose substantially as shown and explained.

**24,535.—Nelson Birdsall, of Port Jervis, N. Y., for an Improved Spring Hinge:**

I claim the combination and arrangement of the spring, E, and adjusting piece, G and H, applied to a hinge, as described and specified.

I also claim inserting within the spiral spring, E, the tubular spring, I, as described, for assisting the action of the spiral spring, and preventing it from setting or getting out of place with the other parts, as set forth and specified.

**24,536.—L. E. Burdin, of Paris, Ky., for an Improvement in Plows:**

I claim the arrangement of the beam, M, the handles, N, the standard, K, brace, H, share, B, landside, F, cone, A, spindle or shaft, E, braces, C and G, and lug, o, as described, for the purposes set forth.

**24,537.—Alexander, William, and James Campbell, of Harrison, O., for an Improvement in Corn Planters:**

We claim the described arrangement of the inclined slides or valves H H', levers, J J', adjustable rods, o o, and cam weeel, k k, for the purpose explained.

**24,538.—J. A. Campbell, of New Orleans, La., for a Job and Card Printing Press:**

I claim fastening the cylinder permanently on its solid axle, E, and also fastening the ends of this axle securely into the slides, F.

I also claim, in combination with the cylinder, L, the revolving of the roller frame, H, on the solid axle, E, as its working center, while the axle itself does not revolve, either by eccentric wheels, which are to be used when the cylinder vibrates, or by plain ones when it is stationary.

I also claim the eccentric wheels, G and G', in combination with the cylinder, L, for the purpose specified.

I also claim the cranks, R, and connecting rods, D, in combination with the cylinder, L, the inking frame, H, and the eccentric wheels, G and G'.

I also claim the combination of the cranks, S, the connecting rods, T, the slots, Y, the pins, W, and the bottoms, X, with this press, as specified and described.

**24,539.—W. J. Cantelo, of Burlington, N. J., for an Improvement in Stoves:**

I claim the exterior casing, A, and inner adjustable casing, H, in combination with the fire-pot, F, and cone-shaped grate, G, when the several parts are arranged, substantially as and for the purpose set forth.

**24,540.—T. F. Christman, of Wilson, N. C., for an Improvement in Machines for Hoisting Bricks:**

I claim the combination of the rollers, D D, with the saddle and

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buckets, E F, supported by rollers, J J, the whole combined and described as a machine for elevating brick, and made to operate in the manner as set forth.

### 24,541.—Giles Cramton, of Marshall, Mich., for an Improvement in Seed Planters:

I claim the application and use of the pulleys, P 1, P 2, P 3, in combination with the adjustable hanger, T, tension bar, R, lever, H 2, and yoke, U, with its attached spring stops. W W, the whole being arranged, constructed and operated substantially as and for the purposes specified.

### 24,542.—C. B. Davis, of Lawrenceburgh, Tenn., for an Improvement in Machines for Sowing Fertilizers in Drills:

I claim the arrangement of the hopper, A, wheels, B 1 B 2, frame, C C, handles, D D, shoe, E, handle of shoe, H, pins on wheel, b b, and axle-trees, G G, as described, for the purpose set forth.

### 24,543.—Aurelius Dickinson, of Claremont, N. H., for an Improvement in Apparatus for Purifying Gas:

I claim the washer constructed as described, with horizontal plates, B B, corrugated or with the bottoms partly or wholly concave, and with upright plates projecting above and below the said plates, and dipping into the water below the said plates, and with orifices so arranged in the highest portions of the said horizontal plates, as to cause the cause the collection of the gas in the concave portions of the said plates, below and around said orifices, substantially as described.

### 24,544.—Geo. Dieffenbach, of New York City, for an Improvement in Bases for Artificial Teeth:

I claim the composition of matter consisting of sulphate of alumina and other ingredients, substantially as described, for the purpose as set forth.

### 24,545.—Geo. Dieffenbach, of New York City, for an Improvement in Process for Coloring Artificial Teeth:

I claim developing the color of a cured or hardened composition, by the agency of solar light, when the coloring matter is incorporated into the said composition, while in its plastic or uncured state, substantially as described.

### 24,546.—Wm. T. DeGolyer, of Schenectady, N. Y., for an Improvement in Connecting Boards for Roofs, &c.

I claim covering the joints of boards or plank for roofing, by means of sheets of metal bent in the form shown at a b c, so that the strips of wood or other packing used shall lie on as well as against the flanges turned on said metal, as represented.

### 24,547.—J, H. Duhme, of Cincinnati, Ohio, for an Improvement in Furnaces:

I claim the arrangement of the flue spaces, A A′, controlled by dampers, H and G, for the purpose of increasing and perfecting the combustion, substantially as set forth.

### 24,548.—J. H. Ferguson, of Baltimore, Md., for an Improvement in Cartridges:

I claim a waterproof and inflammable cartridge made substantially as described.

### 24,549.—B. G. Fitzhugh, of Frederick, Md., for an Improvement in Harvesting Machines:

I claim the combination of a rake and reel revolving on the same shaft, when the rake is so made as to deliver the cut material in a line oblique to the swath of the machine, substantially as described.

### 24,550.—M. R. Flanders, of Parishville, N. Y., for an Improvement in Grain Cradles:—

I claim attaching the finger standard, B, to the swath, A, by means of the rod, C, and eye, b, secured respectively to the standard and snath, in connection with the compensating or adjustable braces, H J, the whole being constructed and arranged substantially as and for the purpose set forth.

[The finger standard is attached to the swath in a novel manner in this invention, and the fingers are braced and connected together so that the several parts are rendered capable of being readily adjusted to suit the operation as occasion may require, and a very strong and durable implement is obtained.]

### 24,551.—Peter Fontain, of Philadelphia, Pa., for an Improvement in Gas Purifiers:

I claim the receptacle or receiver, E, in combination with the filtering and purifying apparatus, arranged and operating substantially as described for the purpose set forth.

### 24,552.—John Galt, of Philadelphia, Pa., for an Improved Reciprocating Propeller:

I claim combining the buckets, E E, and E′ E′, with the frames, D D′, and with the driving rods, F F′, or their equivalents, by means of crossheads, G G′, and H H′, link connections, f f f′ f′, and slots, c c, c′ c′, and d d d′ d′, substantially as and for the purpose specified.

I also claim the construction of the propellers with the frames, D D′, of flaring form, and with their buckets fitted to the smaller front portions thereof, substantially as and for the purpose specified.

I also claim constructing the driving rods, each in two parts, one of which connected with the buckers, is capable of being connected with or disconnected from the other at pleasure, for the purpose either of closing the buckets before the backward movement, and opening them before the forward movement of the propeller frame D or D′, commences, or of causing the closing of the buckets before the forward, and the opening of them, before the backward movement, as may be desired, and thereby enabling the action of the propeller to be required, without reversing the engine.

[There is a kind of reciprocating propeller that consists of a horizontally reciprocating upright frame fitted with buckets which as the frame moves in a backward direction present their edges to the water, and leave the frame open. This invention relates to such apparatus, and consists in a mode of combining the buckets with the frame of the propeller, and with the driving rod or its equivalent, whereby the closing and opening of the buckets before the commencement of the frame in either direction is insured. It also consists in the construction of the frame of the propeller, and the application of the buckets thereto, in such a manner that as the propeller moves back against the water to propel the boat, it collects the water in a compact body against its buckets, and so acts with the greatest possible effect. There is also a simple method of reversing the propeller to back the vessel.]

### 24,553.—Wm. H. Gray, of Dover, N. H., for an Improvement in the Let-off Motion for Looms:

I claim the board, or plate, k, and springs, n n, applied to the breast beam of the loom, and combined with a clutch, by which the yarn-beam can be thrown into gear with the cam shaft or crank shaft of the loom, to operate substantially as and for the purpose described.

[In this invention the tension of the cloth and warp produced by the action of a positive take-up is made to govern the delivery of the yarn from the yarn-beam, and the warp is kept uniformly at the tension desired, irrespective of temperature, moisture, or any other influences, and consequently the cloth is made of as uniform a quality and texture as the natural and unavoidable inequalities of the yarn will allow.]

### 24,554.—Christian Gingrich and J. K. Gingrich, of Annville, Pa., for an Improvement in Rotary Harrows:

We claim the clearers, H, in combination with roller, G, and ring, B, when arranged substantially as and for the purposes set forth.

[Cleavers are arranged upon the weighted arm of a rotating harrow, so as to precede the traveler or friction roller which supports the weight, and keep the annular ring upon which the traveler rolls clear of dirt in using the harrow, and an adjustable draft bar is added to place the line of draft in any position that may be desirable.]

### 24,555.—C. P. Gronberg, of Montgomery, Ill., for an Improvement in Raking Attachment for Harvesters:

I claim the peculiar arrangement of the mechanism, namely, the reciprocating rack-bar, D, and semi-circular toothed bar, d, in connection with the bent rack shaft, E, provided with a spring, h, arm, m, and part pinion, G′, and the semi-circular bar, j, on the support, e′, provided with teeth, k, and a projecting arm, n, for joint operation, substantially as and for the purpose set forth.

[In some harvesters the raking attachment consists of a vibrating ake that moves over a sector or quadrant-shaped platform, and the present invention is an improvement upon such a device, so that with very simple means the rake is operated, and it may be applied or adapted to the generality of harvesters in use.]

### 24,556.—Heinrich Guth, of New York City, for an Improvement in Alcohometers:

I claim an alcohol indicator, substantially as described, by which the evaporation of a fixed quantity of alcholic liquid is made to indicate the exact per centage of alcohol contained in the said liquid, for the purpose set forth.

### 24,557.—James Harrison, Jr., of New York City, for an Improved Machine for Making Upholstery Springs:

I claim, first, Giving one or more of the forming rollers a positive rotary motion at a velocity which causes its or their periphery or peripheries to move faster than the periphery of that part of the mandrel in conjunction with it or them at any time in the operation, substantially as and for the purpose set forth.

Second, Connecting the axle of the roller, g2, or any of the forming rollers, by a link and two universal joints, with a shaft having a longitudinally sliding and also a rotary motion, for the purpose of giving the said roller a rotary motion and a motion along the mandrel, and allowing it to accommodate its position to the varying diameter of the mandrel, substantially as described.

### 24,558.—J. F. Holloway, of Saline Mines, Ill., for an Improved Ship's Capstan:

I claim a capstan having a vertical movement as well as a rotary one, substantially in the manner and for the purpose specified.

### 24,559.—Marcus L. Horton, of Lebanon, N. H., for an Improvement in Stoves:

I claim the ventilator, I, with valve, h, and hood, g, as arranged, and in combination with chambers, H H′ E E′, and flues, G G and D, operating as described, and for the purpose set forth.

### 24,560.—D. L. Hubbard, of Glastenbury, Conn., for an Improved Apparatus for Tanning:

I claim the wheel or cylinder, B, having its periphery formed of oblique slats, c, placed within the vat, A, and arranged to operate as and for the purpose set forth.

I further claim, in combination with the wheel or cylinder, B, constructed as described, the apron, C, for the purpose specified.

[A wheel or cylinder having a periphery formed of slats, and placed within a suitable vat, is employed in this invention, so that the hides, being stretched on the cylinder, can be turned, and all their parts properly exposed to the action of the tannin and fresh bark that is added, as well as the spent bark allowed to be removed from the liquid in the vat without agitating the liquid sufficiently to appreciably deteriorate it by the absorption of oxygen—a contingency that often occurs by the usual manipulation of hides in vats.]

### 24,561.—W. G. W. Jaeger, of Baltimore, Md., for an Improved Apparatus for Condensing Coal Oils:

I claim the employment of a fan-blower, when the same is used to draw the vapors from the retort, in the manner and for the purposes set forth.

Second, And in combination with the fan-blower or draft so used, I claim the escape pipe, x, and trap, a′, arranged and operating as set forth.

### 24,562.—J. C. Jeffries, of Mount Vernon, Ind., for an Improved Bedstead Fastening:

I claim the construction, use and application of a bedstead fastening formed with male and female plates, a a g g, Figs. 2 and 3, provided with tongues, b b h h, and hooks, c c i i, when a ranged in combination with a post and rail, substantially in the manner as set forth and described.

### 24,563.—E. C. Knight, of Philadelphia, Pa., for an Improvement in Arranging Couches in Railroad Cars:

I claim, first, The mode of arranging berths or couches over backs of railroad car seats, substantially as set forth.

Second, I claim the manner of supporting the backs of the seats by slides, E″, and rods, F, for the purpose shown and described.

### 24,564.—M. W. Knox, of Sheridan, N. Y., for an Improved Cross-cut Sawing Machine:

I claim, first, The arrangement of the several parts of a sawing machine, as herein described, whereby the operator can manage the sawing, elevating and depressing the saw, and opening and closing the clamp, without changing his position in relation to the machine.

Second, The guides, O, and blocks, r, when arranged in combination with the saw, in the manner specified.

### 24,565.—Isaac W. Lamb, of West Novi, Mich., for an Improvement in Braiding-machines:

I claim, first, The combination of the two sets of shuttle-carriers, K K K′ K′, rotating in opposite directions in concentric circles, and the shuttle-changers, N N′, having the movements described, the whole operating substantially as set forth.

Second, The construction of the shuttles, each with two openings, r s, and with a spring dog, u, entering both openings, to operate in combination with the inclined surfaces and stops of the shuttle-carriers and shuttle-changers, substantially as and for the purpose described.

Third, The combination with the shuttles of the nippers, v v, and their several appendages and appliances, by which their bite or friction upon the plaits are regulated and rendered uniform, substantially as and for the purposes described.

### 24,566.—W. D. Ludlow, of New York City, for an Improvement in Preserve Cans:

I claim the described combination of the key, D, with lugs, E, attached, in the manner shown, to the sides of a cavity, a, in the top of the can, in order to prevent the disruption of the said lugs during the act of closing the can and avoid projections above or beyond its periphery.

### 24,567.—Wm. H. Main, of Liverpool, Ohio, for an Improved Machine for Folding and Packing Wool:

I claim the herein-named devices for rolling the fleece into a compact cylindrical form, namely, the combination of the belt, G, rod, H, hooks, I, and pins, K, the same being operated by means of the windless, E, and screw, S, in the manner and for the purpose specified.

### 24,568.—Gardner Maynard, of Ilion, N. Y., for an Improvement in Cultivator Teeth:

I claim the arrangement of the tooth, A, stay, C, and wrought-iron stem and brace, B, when the stem is welded between the wings of the tooth and made to form a brace, substantially as set forth, the whole being constructed and used in the manner specified.

### 24,569.—Chas. M. Burney, of Roxbury, Mass., for an Improvement in Packing for Stuffing Boxes of Pistons:

I claim a packing for stuffing boxes composed of canvas and india-rubber, as set forth, and cut diagonally as described.

### 24,570.—Samuel Mills and Geo. E. Mills, of New York City, for an Improvement in Machines for Pulverizing Minerals:

We claim a series of circular grooved and roughened metallic plates working upon their edges side by side in a trough or cylinder, the circle being larger than the plates, which have an alternating motion in combination with each other and the cylinder, and in connection with the rock-shafts and levers, for operating the same, substantially as described and for the purposes set forth.

### 24,571.—Thos. Mitchell, of Lansingburgh, N. Y., for an Improved Machine for Finishing Hair-brush Handles:

I claim the rotating cutter-wheels, D D, and guards and guides, F, in combination with the clamps, G K, provided with patterns, H H′, arranged substantially as and for the purpose set forth.

I also claim centering the unfinished brushes in the clamp, G, by means of the bristles, i, in connection with the strip or plate, J, and the inner edge of the pattern, H, or its extension, H″, substantially as described.

[Rotary cutters are employed in this invention, together with guards and guides and clamps combined with patterns, whereby the backs and stocks of brushes may, by a very simple manipulation, be expeditiously shaped or cut out in proper form.]

### 24,572.—Marie Heloise Nicolas and Louise Josephine Champagne, of Thibodeaux, La., for an Improvement in Defecating Sugar Juices:

We claim the employment in the bleaching and defecating of sugar juices, of the herein described combination of sulphur and lime, prepared in the manner substantially as set forth.

### 24,573.—Henry S. North and John O. Couch, of Middletown, Conn., for an Animal Trap:

We claim, first, The combination of the many-chambered cylinder, A, with the breech-pin, C, by means of a central counter-bore in the said cylinder, meeting the chambers, a a, and a groove or recess, c, all around the end of the breech-pin, substantially as described, whereby communication is made between the chambers of the cylinder, and all are enabled to be fired at once with a single vent.

Second, Fitting the hammer in the form of a ring to slide along the exterior of the breech-pin, C, as described.

Third, The combination with the hammer applied to slide along exterior of the hollow breech-pin, of a rod, B, sliding through the center of the cylinder and within the breech-pin, and a spring sear, j, attached to the said rod and working through a slot, K, in the breech-pin, substantially as described.

Fourth, The combination with the hammer applied outside of the hollow breech-pin of a collar, g, or its equivalent, applied within the breech-pin, and having pins or ears, h h, projecting through slots, i i, in the sides of the breech-pin behind the hammer, and a helical spring, F, applied within the breech-pin behind the said collar, or equivalent, substantially as described.

Fifth, The extension of the central rod, B, which carries the sear directly through the cylinder and through the hollow breech-pin, so that it may be operated either by a pull at its front end or by a push at its rear end, substantially as described.

Sixth, In combination with the many-chambered cylinder, A, hollow breech-pin, C, hammer, E, central rod, B, sear, j, and spring, F, and collar, g, as described, we claim the stock, D, and trigger, p, applied as described, to make a weapon that can be baited and set for shooting game, by the seizure of the bait, or that can be used in the hand like an ordinary pistol or fire-arm, as set forth.

### 24,574.—Chas. Peck, of New Haven, Conn., for an Improvement in Tool-holders for Lathes:

I claim, first, The combination of the tool-rest, g, with the segment, i, or their mechanical equivalents, so as to elevate or depress the cutting instrument, when arranged substantially in the manner and for the purpose described.

Second, I claim the T-slotted bed-plate, with the tool-rest, g, connecting the tool-posts, d d, when combined substantially in the manner described, so as to allow the cutting-tool to be placed at any required angle horizontally.

### 24,575.—George Race, of Norwich, N. Y, for an Improved Clothes Dryer:

I claim, first, The employment of a hollow post enclosing the arms of the reel, in which the arms may be elevated and depressed through its top, in the manner and for the purpose set forth.

Second, The combination of the sliding head, H, and the arms, D, hinged to said head at their lower extremities, and connected by cords or other equivalent connection at their upper extremities, substantially as and for the purpose described.

Third, The combination with the foregoing of the cord and pulleys, the pinion, m, rack, F, and latch, t, for elevating and securing the head, H, in the hollow post, when the whole is constructed and operated, substantially in the manner set forth.

### 24,576.—Wm. Raymond, of Marlboro', N. H., for an Improved Machine for Driving Hoops on Pails, etc.:

I claim the employment of a driver, when either fixed or turning loosely in its bearings, and operated by means of a jointed lever, or otherwise, so as to press against and drive the hoop upon the tub, when a rotary motion is given to said tub, as above described.

[A conical wheel is arranged in suitable bearings in a jointed lever having a universal motion, so that when the hoop is placed upon the tub or pail, or other like utensil, and a rotary motion given it, the edge of the wheel is brought in contact with the edge of the hoop, which it presses to its proper position on the tub without indenting or in any way damaging the staves.]

### 24,577.—Wm. Resor, of Cincinnati, Ohio, for an Improvement in Cooking Ranges:

I claim the peculiar construction of the plate, A B, which constitute the upper plate of the stove, forming, as it does, the plate of the stove the arched roof of the damper chamber, and part of the chimney pipe, in the manner and for the purpose set forth.

### 24,578.—Delos E. Rice, of Detroit, Mich., for an Improvement in the mode of Lifting Stamps for Crushing Ores:

I claim the application of the folding wedges, c c and w, in combination with the band, b b, or their equivalents, substantially as described, thereby producing, as desired, a uniform lift of the rods, together with the stamp heads.

### 24,579.—Alex. Rickert, of Schoharie, N. Y., for an Improved Machine for Turning Hubs:

I claim, first, The graduated scale, 1, in combination with the inn dex, 2, and the sliding frame and hub blank and mandrel, operating in connection with the cutters, in the manner and for the purpose described.

Second, I claim the constructing the sliding sleeve with an opening at the angle, so as to slide over and upon the large cutter on the shaft, so as to cut any required size of hub without change of knife as described.

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And I claim the constructing the sliding sleeve (or cutter and stock) to pass over and mask the fixed knife on the shaft, in connection and combination with the making one of the sides of the sleeve thicker and heavier than the other, in order to approximate to an equipoise of the shaft.

Third, I claim the setting and adjusting (by means of the slot and screw-bolt in 19) the arm, 18, so as to cut any required length of hub, and so arranged upon the bar, 19, as to allow it to vibrate, for the purpose of bringing up the cutters to the hub, or throwing them back when required, and without interfering with the screw or the adjustment of the arm.

### 24,580.—Wm. J. Rivers, of Sumter District, S. C., for an Improvement in Cotton Cultivators:

I claim the handles, 1, helve, 2, beam, 3, foot bar, 10, plow, 20, harrow, 45, roller-frame, 6 7, and roller, 8, when the whole are arranged for joint operation as described, for the purpose set forth.

### 24,581.—C. B. Sawyer, of Fitchburgh, Mass., for an Improved Apparatus for Heating, Cooking and Ventilating:

I claim the the combination of the oven, O, and range, e, with the fire-pot, d, fire-flues, T, and air-pipes, P Q S, substantially as described.

### 24,582.—P. B. Sheldon, of Prattsburgh, N. Y., assignor to himself and J. T. Upson, of Huron, N. Y., for an Improved Broom Clasp:

I claim the feathers or ribs, g g, in combination with the screw threads of the shanks, f f, and with the handle, D, constructed as described, for the purposes specified.

I also claim the combination of the conical screw-shanks, f f, conical screw-ferrule, s, and screw-bolts and nuts, m n, arranged substantially as and for the purpose set forth.

I also claim the wires, B B, attached to the jaws, A A, and arranged in combination therewith, in the manner and for the purpose described.

### 24,583.—Adon Siddall, of Ramson, Mich., for an Improvement in Corn-shellers:

I claim the arrangement of the stirrup, M, with the levers, J J, for operating the adjustable sliding pressure-bar, H, in the manner described and for the purpose set forth.

### 24,584.—Wm. Skene and Robt. Skene, of Louisville, Ky., for an Improvement in Power-pulley Presses:

We claim, first, The arrangement of the scroll, D, and the conical windlasses, E E', to operate in combination with the windlass, H, and with the two followers, B B', or their equivalents, substantially as and for the purpose specified.

Second, Arranging the scroll, D, and the windlasses, E E', or their equivalents, on slides, C, which are rigidly attached to the upper follower, B, so that the weight of those parts assists in increasing the pressure on the substance placed between the two followers, substantially as described.

Third, The arrangement of the two followers, B B', with pulleys, k k' and l l', to operate in combination with the scroll, D, the cone windlasses, E E', and the ropes, d and e e', substantially as and for the purpose set forth.

### 24,585.—Wm. Skene and Robt. Skene, of Louisville, Ky., for an Improvement in Power-gear Presses:

We claim the arrangement of the windlasses, J, the weight, L, the scroll, I, and the pinion, H, to operate in combination with the cog-wheel, G, the pinions, E and E', the double-rack, D, and the follower, B, substantially as and for the purpose specified.

### 24,586.—M. D. Snyder and S. A. Snyder, of Clarendon, N. Y., for an Improved Carpet Fastener:

We claim an improved carpet hook, consisting of the barbed shank, a, gage notch, d, throat, c, and rectangular clinching hook, b, all constructed and combined, substantially in the manner and for the purposes shown and described.

### 24,587.—John L. Stewart, of East Boston, Mass., for an Improvement in Retorts for Distillation of Coal:

I claim my improved revolving web retort, constructed not only with its induction and eduction openings arranged at or near one end of it, but with an endless or other proper carrier, made so as to operate to receive the coal or matter to be distilled from or near one end of the retort, and carry or force the same toward the opposite end thereof, and from thence backward toward the front end, and there discharge such, the same causing the coal or matter to be distilled to pass twice through the retort or carbonizing chamber, in manner and for securing advantages specified.

And, furthermore, I claim, in combination with the retort, or its discharging mouth, a water-sealing trough and an endless carrier to operate in such trough, substantially as specified, to receive or carry away from the retort the discharged coke or products, the water of the trough, under such application of it to the discharging mouth, serving to furnish vapor or steam to the retort in manner and to effect an advantage in the distillation of the coal or matter therein, as specified.

### 24,588.—J. C. Stoddard, of Worcester, Mass., for an Improvement in Machines for Making Hay:

I claim arranging the rakes in radial slots between the two drum-heads, K, and fixing them therein, so as to serve the purpose of a hay-making, and by a simple change, a hay-raking machine, substantially in the manner set forth.

[This machine performs the operations in hay-making which are usually done by hand, and by its use hay is cured quicker and much cheaper than in the ordinary way. The machine will also act as a horse-rake.]

### 24,589.—Joseph Souter, of Chicago, Ill., for an Improvement in Apparatus for Drying Grain:

I claim the drying of grain by means of heated air within a vertical cylindrical chamber, which is provided with a series of tapering rims, r, and a central shaft, y, which is armed with a series of winged scattering-wheels, w, when a fan or some other equivalent means is employed for producing an upward current of heated air through the said chamber, in the manner set forth.

### 24,590.—Geo. S. G. Spence, of Boston, Mass., for an Improved Apparatus for Heating Buildings:

I claim the arrangement of the elevated sides of the boiler in combination with the pipe, H, or its equivalent, depressed within the same for heating and distributing the air in the manner and for the purpose set forth.

### 24,591.—A. G. Stipher, of Richmond, Ind., for an Improvement in Harvesting Machines:

I claim, first, The employment or use of the tilting spring rake, D, in combination with the sliding raker frame, d, constructed and arranged substantially as and for the purposes set forth.

Second, Operating the raker frame, d, and raker, D, by means of the reciprocating bar, F F', through the medium of the rack, F", cog-wheel, i, pulley, g', and cord, g", all being arranged substantially as and for the purposes set forth.

Third, The combination with the raker, D, the sliding trap-doors, E, operated by means of the bent levers, G, springs, K, and cams, b, substantially as and for the purpose set forth.

### 24,592.—A. H. Tait (assignor to Geo. B. Hartson), of New York City, for an Improvement in Defecating Sugar Juices:

I claim the employment of the sulphate of tin, applied in manner substantially as described, for defecating cane juice and sirups as set forth.

### 24,593.—R. P. Thomas, of Syracuse, N. Y., for an Improvement in Frames for Manufacture of Soap:

I claim lining soap frames in ordinary use with flexible metallic plates, substantially in the manner and for the purpose set forth.

### 24,594.—C. G. Udell, of Morris, Ill., for an Improvement in Corn-planters:

I claim, first, The arrangement of the grain box, A, tubes, B B, connecting bars, E E, and legs, I I, the whole being constructed and operated substantially in the manner and for the purpose set forth.

Second, In combination with the above, I claim the measure, L L, marking-rod, M, and guide, K, the whole being constructed and operated substantially in the manner and for the purpose set forth.

### 24,595.—T. F. Wagoner, of Trenton. N. J., for an Improvement in a Machine for Hulling and Scouring Grain:

I claim the combination of two surfaces, one of which is elastic and the other hard, when the planes of said surfaces are placed on a plane with the horizon, and one of them having a circular motion for the purpose of hulling and scouring grain, substantially as set forth.

### 24,596.—H. L. Watts, of Chester, Mass., for an Improved Horse-shoe Machine:

I claim the arrangement and combination of the slotted carriage, B, the die, C, the followers, I, the rollers, J, as and for the purpose shown and described.

### 24,597.—John Young, of Joliet, Ill., for an Improvement in Rotary Cultivators:

I claim the arrangement and combination of the skeleton or open rotary plowing cylinder, when the mold-boards thereof are set tangential, and extent from end to end of the cylinder in a straight or oblique direction, in combination with a rotary shaft or circular edge disks, the whole being operated substantially as and for the purposes set forth.

### 24,598.—McClintock Young, Jr., of Frederick, Md., for an Improvement in Harvesting Machines:

I claim combining the handle, S, of the rake, C, with the shaft, R, by means of the supporter, c, the shaft-arm, g g, the crank, e, the pitman, h, and the pitman, i, and in such a manner that the rotation of said shaft will steadily and positively impart the desired movements to the rake, substantially as set forth.

I also claim the combination of the cams, D D', and the guides, a b, or either of them, with the above described mechanism for operating the rake, constructed and arranged in the manner and for the purpose substantially as described.

### 24,599.—E. B. Cherevy (assignor to himself and T. W. Weathered), of New York City, for an Improvement in Furnaces:

I claim the hollow dome, k, over the fire, in combination with the dome, h, in the manner and for the purposes specified, whereby the heat ascends into said dome, k, and then passes away between the domes, h and k, heating the circulating water, as specified.

I also claim the thimbles, o o, passing through the flanges, 2 and 3, and forming openings for the circulating water, substantially as specified.

### 24,600.—Samuel Clark (assignor to W. O. Bourne), of New York City, for an Improved Mode of Imparting Momentum Motion to a Sifting Apparatus:

I claim, first, The imparting a short, quick or jarring motion to a sifting apparatus, or machinery of any kind, where such motion is desirable, by means of an oscillating, vibrating or reciprocating weight, brought, at the end of its motion, into contact with the said apparatus, or its attachments, the same being arranged and constructed in the manner described at d e f h and i, or its equivalent.

Second, Suspending the object to which the motion is applied by means of a suspending or supporting link or rod, with concave bearing parts uppermost at both ends and convex bearing parts undermost, constructed as above set forth at l m n k and r, or in an equivalent manner.

### 24,601.—Daniel Foreman (assignor to himself, G. W. Sweringen and Jonathan Penoyer), of Navarre, Ohio, for an Improvement in Seeding-machines:

I claim the arrangement and combination with the interior of the peculiarly formed hollow slide, E, of the adjustable plate, i, substantially as and for the purposes shown and described.

[This invention consists in distributing or discharging the seed from the seed-box by means of a cup having a vertical reciprocating motion and used in connection with an adjustable gage, the parts being so arranged that several advantages are obtained, viz., the discharging of the seed without cutting or breaking it in the act of measuring, the accurate gaging of the device so as to discharge the seed in greater or less quantities as desired, the effectual prevention of the clogging or choking of the device, and the general simplicity and economy obtained in the construction.]

### 24,602.—W. H. Grey, of Dover, N. H., assignor to himself and Luther Robinson, of Melrose, Mass., for an Improvement in Let-off Motion for Looms:

I claim, first, Combining the clutch, h h i i, or its equivalent, by which motion is imparted to the let-off mechanism, with the yarn-beam, by means of a worm-gear, d, on the yarn-beam, and an endless screw, e, and spring, g, applied, substantially as described, to the shaft, E, which controls the rotation of the beam, and operating as set forth.

Second, In combination with the worm-gear, d, endless screw, e, and spring, g, applied as described, I claim the lever, H, applied between the said spring and the surface of the yarn on the beam, and operating substantially as specified.

[This invention consists in a novel mode of applying the let-off mechanism in combination with the yarn-beam of a power loom, and in certain improvements in such mechanism for the purpose of governing, in a very perfect manner, the delivery of the yarn from the beam by the tension produced on the cloth and warp by the action of the take-up, and thereby preserving a uniform tension and an even quality and texture of the cloth.]

### 24,603.—Levi C. Johnson (assignor to himself and J. B. Smith, of Buffalo), N. Y., for an Improved Portable Door Fastener:

I claim the sliding bar, D (including the plate, F), when so constructed as to form the slot, H, and so connected and arranged with the plates, A and A', and bolt, B, as that, when placed in the door for use, the bar, D, will stand at right angles with the bolt, B, and when folded for carrying in the pocket, the plate, F, will cover the teeth or spurs of plate, A, substantially as described.

### 24,604.—E. G. Pomroy, of New York City, assignor to J. R. Pomroy, of Brooklyn, N. Y., for an Improvement in the Method of Protecting Iron from Oxydation:

I claim the preparation of iron by corroding or oxydizing its surface, for the express purpose of making the same rough and capable of being closely and firmly united with a covering of fire-proof paint, by means of rolling or other mechanical force, and the application of the other processes above described to iron so prepared, in combination therewith.

### 24,605.—Austin Potter (assignor to himself and J. W. Norton), of Williamson, N. Y., for an Improvement in Grain Separators:

I claim the application of the adjustable slide-board, D, to the endless riddle, E, in such a manner that the grain and straw can be made to impinge upon the end or more open meshes of the same, or upon the top, thereby varying and adapting the action to the quality of grain and straw, and employing the force with which it leaves the cylinder as a means of separating the two, substantially as and for the purposes described.

I also claim the combination and arrangement of the parts consisting of the fan, H, self-vibrating riddle, E, with pulleys, u x, driven directly from the cylinder, B, elongated shaker and board, R G, and intermediate adjustable slide-board, D, operating conjointly, substantially as described, to form a more portable, cheap and effective separating attachment to threshing-machines, as set forth.

### 24,606.—C. A. Stebbens (assignor for himself and R. J. Todd), of Boston, Mass., for an Improvement in an Apparatus for Oiling Cylinders and the Pistons of Steam-engines.

I claim the combination of the lifter, f, and tubular holder, h, or their equivalent or equivalents, with the valve, b, and the piston, C, the whole being constructed and applied together, and to a reservoir, A, and its pump-barrel, B, substantially in the manner and to operate as specified.

## RE-ISSUES.

### Joseph Kingsland, Jr., of Franklin, N. J., for an Improvement in the Process of Grinding Paper Pulp. Patented Dec. 23, 1856 :

I claim the process, substantially as described, of reducing fibrous substances to pulp suitable for making paper, while such fibrous substances are suspended in water, by subjecting them to the operation of grinding or beating action in a closed vessel, to which it is supplied by the hydraulic power of a descending column of water so charged with the fibrous substance, and permitting it to escape and be discharged so soon as it is sufficiently reduced, substantially as set forth.

And I also claim separating the fibers from the mass so soon as they are sufficiently reduced and discharging them by the hydrostatic pressure of the column of water in which the fibers are suspended, and which in flowing upward to the discharge carries with it only the fibers which are sufficiently reduced, substantially as described.

### Joseph Kingsland, Jr., of Franklin, N. J., for an Improvement in Machinery for Grinding Paper Pulp. Patented Dec. 16, 1856:

I claim the combination of the rotating grinder with and enclosed in a surrounding case, which constitutes the opposing grinding surface, and which is provided with a feeding-pipe and discharge aperture, suitable for feeding or carrying the fibrous substances to and from the grinder in the enclosed vessel by the hydraulic pressure of a descending column of water, as set forth.

### Jos. W. Jayne, of Sandusky, Ohio, for an Improvement in Brick Machines. Patented May 5, 1857:

I claim, first, The yoke constructed in the form described, by which converging planes are held firmly in the same position relative to each other whether the same be composed of one or more pieces of metal.

Second, The radial sliding and revolving chargers, in combination with the mold wheel.

Third, The arrangement of the guide stem on one side of the pressers instead of on the end, whereby I am enabled to place the pressing roller in the cavity of the piston.

Fourth, I claim making the piston or presser hollow and inserting the pressing roller in the cavity thereof (instead of placing it upon a guide stem as heretofore done.)

### Henry Jenkins, of Brooklyn, N. Y., for an Improvement in the Process of Manufacturing Wire Grating, &c. Patented, March 6, 1847:

I claim manufacturing screws or other articles from metallic wires or bars that are bent or crinkled at the point of intersection previously to being laid or woven up whereby I am enabled to form meshes of any desired size or shape by such intersecting bars or wires so that they shall be rigid and durable as set forth, and this I claim irrespective of the mechanism for bending or crinkling said wires or interweaving them to form the requisite meshes.

### Miner Van Auken, of Saratoga Springs, N. Y., for Improved Washing Machines. Patented May 11, 1858:

I claim, first, Providing a stop board at the lower portion of the rear end of the rubber, substantially as and for the purpose set forth.

Second, Providing an oblong slot, the lower termination of which is of scroll form, in each of the pendulous arms of the rubber, substantially as and for the purposes set forth.

Third, The combination with said slot of a back trip board, substantially as and for the purposes set forth.

### John Ames (assignee of Thomas Mitchell), of Lansingburgh, N. Y., for an Improved Machine for Finishing Brush Handles. Patented June 23, 1857:

I claim, first, The combination of the crown-wheel saw, O, with the adjustable platform, Y Y, and stop, g, substantially as and for the purpose set forth.

Second, The wheel, K, provided with the oblique cutters, y, in combination with the guard or gage piece, L, the cutter wheel and gage piece being arranged relatively with each other substantially as and for the purpose set forth.

Third, The arrangement and combination of mechanical devices herein set forth and described, to wit: the platform, D, with revolving cutters shaped and operating as described, crown-saw, O, with the arms, d d, and the adjustable platform and cutter wheels, K and M, with their cutters, substantially as described.

[This is a very good machine for cutting and finishing brush handles, and it turns them out very quickly.]

### W. Hopper and R. H. Gratz, (assignees of C. C. Lloyd,) of Philadelphia, Pa., for an Improvement in Valves for Dry Gas Meters. Patented June 22, 1858:

We claim, first, The combination of the rotary valve, c c, with a series of brakes or edges as at f p p and q q, arranged and operating so as to scrape the upper surface of the valve seat.

Second, The drip, K, and valve seat, q q, arranged and operating so as to collect and carry off any liquid deposit in the meter.

Third, The valve carriage, D D, arranged and operating substantially as described.

Fourth, The combination of the valve, c c, the valve-seat, g g, the shafts, E E E, attached to the diaphragms arranged and operating as described, for the purpose of restraining a reverse movement in the meter, and thus dispensing with the click and ratchet.

### H. B. Masser, of Sunbury, Pa., for an Improvement in Ice Cream Freezers. Patented Dec. 12, 1848; Re-issued Jan. 1, 1850; again Re-issued June 28, 1859:

I claim a scraper or scrapers which act or bind during the process of freezing cream with a yielding spring force against the inner surface or surfaces of the cream chamber, substantially as and for the purposes set forth.

## ADDITIONAL IMPROVEMENT.

### A. B. Davis, of Philadelphia, Pa., for an Improvement in Railroad Car Springs. Patented Feb. 15, 1859:

I claim the bore, A, and cover plate, C, secured together by a bolt

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D, or other suitable fastening, in combination with one or more loose plates, H, placed witnin the box, so as to divide the latter into two or more compartments, as and for the purpose set forth.

EXTENSION.

### Ephraim Morris, of New York City, for an Improvement in Machines for Raising and Lowering Weights. Patented July 5, 1845:

I claim the manner of combining the barrel disks, f f, with the wheel, c, for the purpose of hoisting, lowering or suspending weights by means of the ribs and grooves, or any analogous device.

And I claim the further combination therewith of the means employed to govern and regulate the action of said parts, namely, the friction bands, g or g', and levers, h or h', the attaching or detaching lever, l or l', rolling shaft and bit, 4 or 4', pin, 3 or 3', and slide-key, 2 or 2', substantially as such manner and combination are shown and set forth, irrespective of the power employed to work the machinery, and also irrespective of the mode by which power is connected to the working parts.

DESIGN.

### P. J. Clark (assignor to S. S. Clark), West Meriden, Conn., for Design for Match-boxes.

**H. A., of N. Y.**—It is difficult to fix the date of the first invention of the saw. It was not known to the aborigines of this country, but it is certain that the saws of the Grecian carpenters had the same form and were made in the like ingenious manner as ours are at present. This is fully shown by a painting still preserved among the antiquities of Herculaneum, which city was destroyed as early as A. D. 79.

**N. C., of N. Y.**—Steel is blued by heating; knives and other articles that have blue figures on them, have only those parts that are blue exposed to the air while being heated; the white parts may be covered with soap.

**J. E. W., of N. Y.**—We have frequently heard of rain being caused to fall by repeated discharges of artillery, but we are not in possession of any positive data that such is a fact. A heavy rain-storm took place at the battle of Waterloo, but other battles have been fought in sunshine, without being succeeded directly by rain.

**F. P. K., of Georgia.**—You must be mistaken about the sulphate of lime increasing the durability of soap. Water containing sulphate of lime curdles soapsuds and wastes the soap. Any cistern in which soft rain-water becomes hard must have its sides plastered with a cement which becomes soluble in the water. The water can be softened again by adding a little caustic alkali to it; age should rectify this evil in the cistern. There is no real good work published on domestic soap-making, but the process of making it is very simple. If you use lye of sufficient strength, and boil the grease a sufficient length of time in it, soap will be the certain result. Soda lye makes hard, and potash lye makes soft soap.

**C. B. T., of C. W.**—Many advertisers would not state the precise prices of the patented machines or other articles which they have for sale, for obvious reasons. If they did so, the public would be better informed; but the advertisers' interests would often be impaired by the publishing of prices which might seem exceedingly high in the estimation of a purchaser of limited means.

**J. S., of Mass.**—Hoar frost is produced from the dew, which is frozen by the cold into fine crystals.

**L. J. B., of Wis.**—The finest wire ever drawn was by Dr. Wollaston, who drew platinum into wire one-three-millionth of an inch in diameter.

**W. A. H., of R. I.**—We are informed by those who profess to know, that the wages of machinists in England vary from three to seven shillings per day. The most skillful mechanics are generally paid better than the same class in this country, while the common class of workmen get less. We thank you for your good list of subscribers.

**J. A. S., of Pa.**—Use dry charcoal dust for your water cooler, and you will find it answer well for a good non-conductor. Plaster of Paris is also excellent for the same purpose.

**A. O. S., of Ohio.**—Professor W., who furnished the recipe to which you allude, is not in this country at present; so we have been informed.

**H. C., of Ohio.**—Out of the long catalogue of rotary-engine contrivances, a few only have had partial success. It would be impossible for us now to enter into an extended discussion of the faults of such rotarys as have made their appearance. In one case the piston and packing cannot be made steam-tight; in another there is too much friction; in others erroneous calculations of power; in another mal-application of valves. We think it difficult to construct a rotary free from objection and equal to the reciprocating engine. If you have access to Vol. IV., SCIENTIFIC AMERICAN, you will find much useful information on the subject. Your particular arrangement is not new.

**ENGINEER.**—Your mode of combining the fan-governor with the cut-off seems to be new, and we should think patentable. You had better send us a properly prepared sketch, and have a preliminary examination made.

**S. D. McC., of Ky.**—Common gum-arabic dissolved in water will make labels adhere to tin, but it is not equal to shellac varnish in regard to adhesiveness.

**J. J. McF., of Mich.**—A conical bullet with a hollow chamber in its rear, placed in any rifled fire-arm, forms what is called the "Minie" rifle. There is no published work whatever from which you can obtain full information of all the improvements lately made in rifles.

**T. J. R., of N. Y.**—We have been informed that the French bronze their cast iron figures with bronze powders intimately mixed with boiled linseed oil containing a little turpentine. Such powders are also sometimes put on with lac-varnish.

**W. S. R., of Pa.**—A stream of water passing through a notch of two square inches on a fall of eighty feet would be nearly half a horse power; if passing through a notch of two inches square, it would raise 31,406 lbs. one foot high in a minute—nearly one horse power.

**G. A. B., of N. Y.**—We are not acquainted with "Liebig's Goldometer," and never heard of this instrument being patented.

**C. W. J., of Fla.**—You can precipitate the oxy-chloride of lead by muriatic acid poured into a very strong solution of any of the salts of lead.

**W. F. S., of Ind.**—"Tredgold on the Steam-engine" contains all the information you require about the rules for drafting the different parts of engines. It is a very expensive work, costing about 150. It can be obtained from John Wiley, of this city.

**J. A. M., of Ill.**—Galvanized iron has its pores filled with zinc. The coating metal penetrates no further into the iron than the porous nature of the latter will permit. Exposed to the action of carbonic acid in a chimney, galvanized iron rusts as rapidly as sheet tin.

**F. B., of Wis.**—The mineral you sent us for examination is a small module of poor iron ore very much oxydized. It is worth nothing.

**E. J. W., of N. Y.**—A patent could not be obtained for making bank notes of different sizes so as to prevent alteration. The idea is old; but if it were new, such precaution would not avail anything as a protection to those not familiar with bills of all sizes on all the various banks.

**E. L., of Va.**—By heating metal its electrical conducting power is frequently injured by the molecules assuming a different arrangement. Beaume's hydrometer is an instrument of a certain gravity, and is employed for determining the specific gravity of fluids by sinking in them to a depth according to the scale of figures marked on its tube.

**O. D. T. of ——.** You can procure the metal aluminum of Ball, Black & Co., of this city, we think. They had some at one time we know.

**CARRIAGES** should not be kept in a stable where horses stand, for the reason that the ammonia will destroy the varnish.

**E. T. Q., of N. H.**—The expressions "velocity," "reflection," and "conduction" of sound are terms of convenience, just like those of "negative" and "positive" applied to electricity. We do not believe that the balls represented in your sketch, when immersed in water revolve of themselves with a constant motion. We believe inventors can accomplish great things, but there is a point beyond which we should not wish to be publicly discovered, for fear we might be laughed at by knowing ones.

## Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, July 2, 1859:—

J. A. & F. D., of N. Y., $55; S. C. T., of Cal., $30; J. H. G., of O., $25; T. J. W., of Mo., $10; E. D., of La., $60; H. W., of Vt., $30; J. L. M., of N. Y., $25; F. B. W., of Ill., $55; A. H. C., of N. J., $25; T. G. G., of Ill., $30; A. M., of N. C., $40; H. W. H., of Ct., $35; R. A. W., of Miss., $50; J. S. L., of Pa., $30; T. R., of N. Y., $250; G. W., of N. Y., $20; S. B., of N. J., $27; I. F. B., of Ct., 25; G. W. R. B., of La., $60; J. W. McL., of Ind., $25; J. W. T., of Ala., $10; W. S. T., of Iowa, $30; E. N., of Mass., $25; C. F., of Conn., $25; D. W. G. H., of Me., $30; T. W., of R. I., $12; J. S., of Ind., $20; J. L. D., of Ohio, $55; B. F., of Ind., $30; M. L. T., of Wis., $25; L. R. R., of N. Y., $25; L. B. T., of Mass., $25; D. & A., of N. C., $100; H. R. of Cal., $25; R. G., of Pa., $10; S. F. L., of Cal., $30; H. S., of R. I., $25; V. L. M., of Pa., $10; W. H. N., of Ct., $57; G. & F., of N. Y., $25; A. L. E., of N. Y., $30; F. W., of Pa., $25; J. W. C., of —., $100; A. C. K., of N. Y., $30; J. D., of Ga., $30; W. H. S., of Mass., $100; C. R. H., of Wis., $30; C. W. S., of N. Y., $25; S. B., of N. J., $27; E. E., of Tenn., $55; S. B., of Va., $30; R. D. N., of N. H;, $55; B. C. H., of Wis., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 2, 1859:

J. H. G., of O.; H. N., of N. Y.; C. F., of Conn.; H. S., of R. I.; F. W., of Pa.; H. W. H., of Ct.; J. W. McL., of Ind.; J. F. B., of Ga.; C. B., of Pa.; G & F., of N. Y.; A. H. C., of R. I.; B. F., of Ind.; M. L. T., of Wis.; S. C. T., of Cal.; E. N., of Mass.; J. W., of R. I.; W. H. N., of Ct.; S. B., of N. J.; H. R., of Cal.; J. L. M., of N. Y.; H. S., of R. I; C. W. S., of N. Y.; T. W., of R. I.; E. E., of Tenn.; J. L. D., of O.; J. H. R.. of N. Y.; L. P. R., of Mich.

## Literary Notices.

**FOWNES' CHEMISTRY FOR STUDENTS.** Blanchard & Lea, Philadelphia.

This is an American reprint of the seventh edition of the most valuable manual of chemistry in the English language. The author, Professor G. Fownes, died almost before it was finished, and each succeeding edition has been carefully supervised in Britain by Drs. Hoffman and Bence Jones. All that is theirs may be relied upon as not only correct, but also in date up to the very time of going to press. As we find the names of London instrument-makers left in the notes as the places whereat to procure apparatus, we do not think much of the care which Robert Bridges, M. D., the American editor, has bestowed upon it in seeing it through the press. Surely he cannot want American students to send to London for a bit of glass tubing. Such things can be procured in this country, we should hope, and special forms of it made to suit the investigations in any science. We are happy, however, to say that the carelessness of one editor cannot deteriorate from the value of the work when the reader knows the shoals to avoid in his perusal of the book.

**LADIES' HANDBOOK OF FANCY AND ORNAMENTAL WORK.** By Miss Florence Hartley. J. W. Bradley, Publisher, Philadelphia, Pa. This little work is a mystery to us; it is full of directions which look like algebra, but the happy results of which are slippers, lounging caps and gloves for gentlemen, and comfortable devices in ladies' wearing apparel, of which of course we cannot speak. It looks a valuable book to ladies—we suppose it is; let them buy it and try.

**BLACKWOOD'S MAGAZINE.** Published by Leonard Scott & Co., No. 54 Gold-street, New York. There is an able article on the navies of Britain and France, this month.

**THE KNICKERBOCKER MAGAZINE** for July. J. A. Gray, Nos. 16 and 18 Jacob-street, New York. L. Gaylord Clark and Dr. J. O. Noyes, Editors.


### Rates of Advertising.

Thirty cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

## IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure Patents for Inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other Agency in the world. The long experience we have had in preparing Specifications and Drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business we have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out Patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining Patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the B anches. We also furnish a Circular of information about Foreign Patents.

The annexed letters from the last two Commissioners of Patents we commend to the perusal of ll persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

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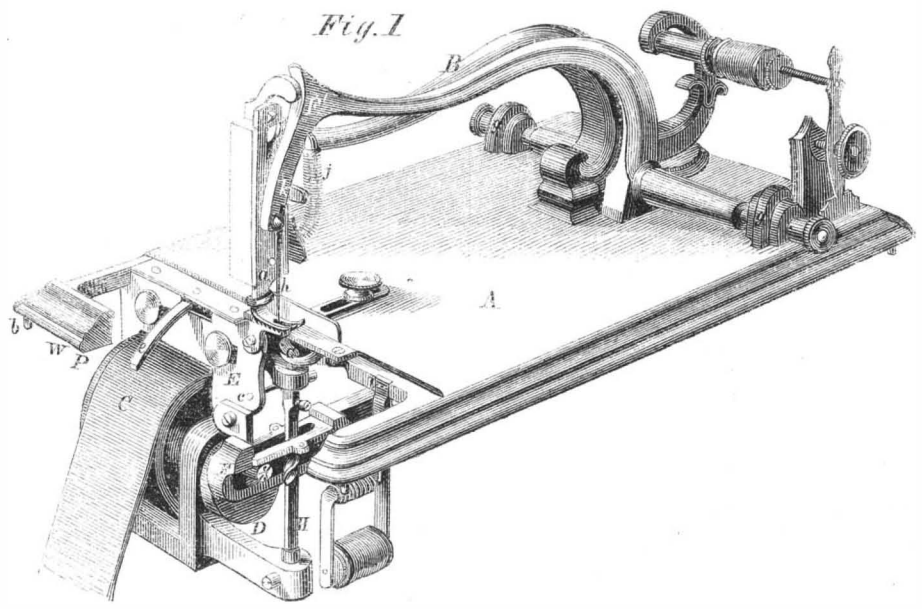
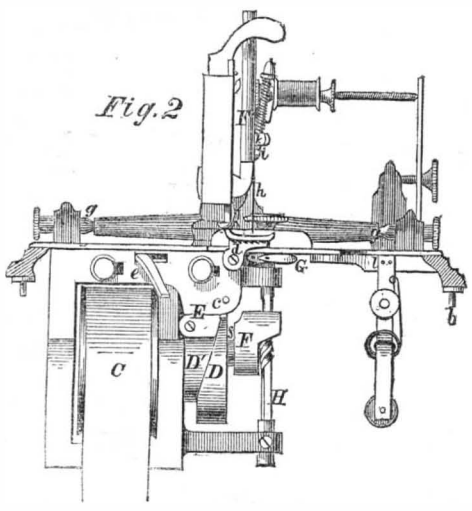



### GROVER & BAKER'S SEWING MACHINE.

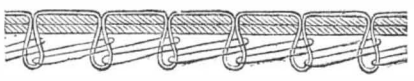
must illustrate the language, and to aid the present article we present a perspective view of the whole, with a piece of the bed-plate removed to show the working parts, Fig. 1; and a front view, Fig. 2.

On the bed-plate, A, is the usual arm, B, that carries the presser, *a*, which keeps the cloth firm while the needle passes through it. The thread is carried on two common spools, and the feed is regulated by the pressure of the bearings on the end of the spindle on which the spool is placed. The bed-plate fits by four small pins, *b*, into four corresponding holes in the stand, and these pins rest in rubber cushions, so that there is no jar and the sound is deadened. On the shaft of the small belt-wheel,

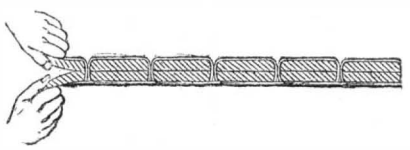



C, by which the machine is operated, is placed a cam-wheel, D, against which the feed-carrier, E, is continually pressed by a spring, *c*, so that as D rotates, E is given a back-and-forth motion suitable for feeding the cloth to the needle, and as the same end of E rests on another cam, D', on the wheel, D, the feed-carrier, E, has an up-and-down motion also, by which it pushes the teeth, *d*, into the cloth, and when they have moved it a sufficient distance for the length of a stitch, then they drop down and move to their former position without touching the cloth. The length of the feed is regulated by a small bar, *e*, which passes through a slot in the top of E, and stops the motion of E, as it is feeding the cloth, at whatever point it is adjusted to.

On the face of D, close to its periphery, a small pin, *f*, projects, and this, working in a slot in the end of bar F, gives it a vibratory or reciprocating motion from its centers, *g*, where it is suspended, and from which, on the upper side of A, it forms the needle-bar proper; this is indicated by F'. The needle, *h*, is secured to this by the head of a screw, *i*, and is consequently no trouble to remove and replace when broken or unfit for use, and still it is secure enough to work well when held tight. The cotton is carried from the upper spool to the needle between the top of the spring, *j*, and the top of this tension, and between two small nippers, *k*, that project from the needle-bar, and which hold the cotton tight while the stitch is being drawn close. Just under the bed-plate where the upper needle descends is a curved needle or looper, G, which is placed on the top of a vertical shaft, H, which passes through and accurately fits a slot in a piece of metal attached to the end of F, and as H is twisted in the center, as F moves up and down, G is caused to have a rotary motion in one direction, and then to retrograde in the same path. This needle, or looper, G, is fed with cotton from a spool that is placed in a small spring-frame that is suspended from the bed-plate, A, by a small angular joint or slot, *l*, so that it can



be brought up to have a spool replaced by simply removing one of the plates that cover the open space in our engraving. The stitch is joined as follows, and its character will be better understood by reference to the diagram, Fig. 3, which shows the thread loosened that it may be better seen. The fine black line underneath is the cotton from the curved needle or looper. Fig. 4 shows the perfect stitch. The straight needle in de-



scending carries the thread through the cloth and passes inside the curved needle; as the straight needle returns back it leaves a loop through which the curved needle passes, locking that stitch, and at the same time the curved needle makes a loop of its own through which the straight needle passes on its next descent, so that each stitch is double-locked, and the cloth may be cut any where and the stitches will not rip.

In this machine every possible care is taken to avoid friction, and to make it work with ease and certainty, and for thin fabrics it certainly is most admirably adapted; but be it understood, that it will also sew anything from muslin to leather. It is manufactured under patents dated February 11, 1851, June 22, 1852, February 22, 1853, October 5, 1858, October 12, 1858, and Howe's patent of September 10, 1846. The machines can be bought, and any further particulars obtained, at the Grover & Baker Sewing Machine Depot, No. 501 Broadway, New York.

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